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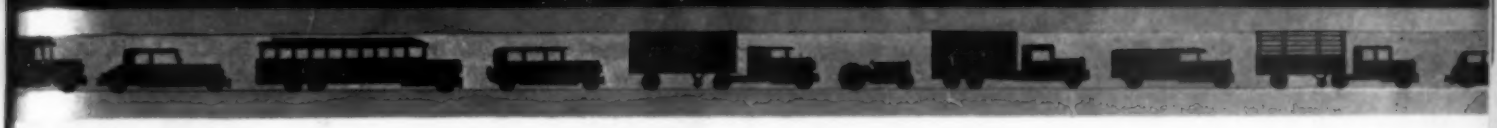
FLEET OWNER

THE FERGUSON PUBLISHING CO., 90 WEST ST., NEW YORK, N.Y.

Devoted to the Better Operation and Maintenance of Truck, Bus, Taxicab, Passenger Car and All Automotive Fleets



ARTICLES:

Modernizing Old Macks
By Ralph Baggaley, Jr.

Analyzing a Fleet Operation
By E. J. Gribbons

Facts About the New "W" Winter Oils
By H. Clay Fischer

Fleet Maintenance for Safety's Sake
By G. E. Weaver

An All-Aluminum Tank Trailer
(How It Was Built)

Does Retreading Pay?
(A Survey)

DEPARTMENTS:

- Trouble Shooters' Forum . . .
- As We Go to Press (News) . .
- Reader Say-So (Correspondence)
- Question-of-the-Month Club . .
- New Products for Road and Shop

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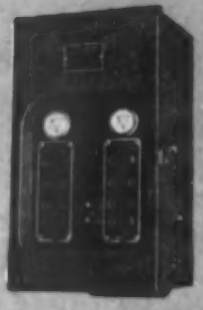

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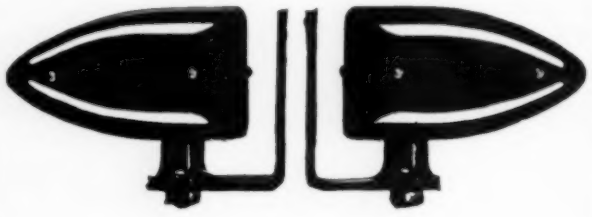

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The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

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For only a few dollars more than the lowest-priced 1½-ton trucks, you can own this quality-built GMC T-18 of ample capacity for the job. During its lifetime, its small extra cost will be saved several times over, through lower operating and upkeep costs.

This GMC T-18 is a big, husky, capable 2-3 ton producer. It will haul loads and maintain schedules in a way you wouldn't expect from lighter and cheaper trucks. Yet it carries no needless weight to eat up gas, oil and tire dollars.

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use Champion Spark Plugs exclusively

The newest in streamlined motor coaches—
THE NEWELL-SWIFT
FULL STREAMLINED COACH
Built on the "deck and one-half" plan. Carries 32 passengers. Uses the new Swift Electro Pneumatic Gear Shift. Powered with 180 H. P. Hall-Scott horizontal type engine located amidship, under the floor of main deck. So situated it is imperative that the best possible spark plug service is secured. Equipped with Champion Spark Plugs No. 13 and No. 18. One of a new fleet of six coaches now under construction for North Coast Lines.

The North Coast Lines, large Pacific Coast bus line operating 85 large buses between Portland, Seattle and Vancouver, use dependable Champion Spark Plugs exclusively. Only three types of Champions are required to meet the widely diversified equipment and operating conditions encountered in 5,000,000 bus miles a year over continuously irregular terrain.

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Powered by the 180 H. P. Hall-Scott horizontal engine, located amidship under the floor of the main deck, it is obviously imperative that the utmost in spark plug dependability and service be obtained. Champions fulfill every requirement based on numerous tests and a background of five years exclusive Champion equipment on other North Coast Lines buses.

Alert, progressive, and exacting operators like North Coast Lines know that it pays to specify Champions. Dealing as he does in terms of bus or ton miles the fleet owner or bus operator must have the utmost in power, speed, economy and dependability from spark plugs. That's why the leaders specify Champions.

If you have a spark plug problem with trucks, buses or commercial vehicles of any kind, the Champion representative in your territory will welcome an opportunity to consult with you. Write factory direct.

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Which Maintain Steering Efficiency

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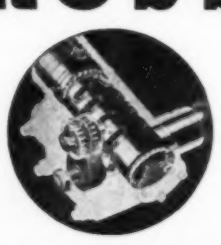
ROSS



CAM & LEVER STEERING

Say "I saw it in FLEET OWNER"—It Helps!

Here is a Marmon-Herrington Model A20-4 (four wheels driving) engaged in the difficult task of building a section of new highway across Lost Prairie in the timbered section of Mason County, Washington.

A Substantial Increase Every Year for Three Years... and NOW Marmon-Herrington Sales Show

A 200% GAIN FOR 1934

A RECORD THAT IS *Vitally Important*

TO ALL TRUCK BUYERS...

THE remarkable growth and success of Marmon-Herrington means two big things to every truck owner, buyer and operator —

FIRST, Marmon-Herrington is firmly established in a position of leadership in the all-wheel-drive industry.

SECOND, the increasing nation-wide and world-wide acceptance of the Marmon-Herrington line is a definite tribute to the advanced design, performance and dependability of Marmon-Herrington all-wheel-drive trucks and truck-tractors.

Every year for the past three years, more and more truck owners have experienced and profited by the advantages of Marmon-Herrington vehicles in operation both on and off the highway. In practically every field of motorized transportation, the exclusive Marmon-Herrington all-wheel-drive features have given more ton-miles at less cost . . . greater tire life . . . greater safety . . . a far wider range of performance and utility.

Back of Marmon-Herrington success is an institution organized on a permanent and financially strong basis . . . an institution with ample and modern manufacturing facilities . . . a wealth of advanced engineering talent. Everything about the company and its policies is as modern as Marmon-Herrington trucks themselves.

If you are interested in giving your truck dollar a new standard of value, write for the complete Marmon-Herrington story. There is a new Marmon-Herrington line with five series and 28 models, beginning at 1½ tons. Every model is an all-wheel-drive with features that are obtainable on no other line on the market.

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A FEW WORDS TO FLEET OWNERS

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All-Wheel-Drive Motor Trucks... Indianapolis, Indiana

INTERNATIONAL

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ARE ALL TRUCK

In every inch of Design
In every ounce of Construction

TRUCK quality must be of a different stamp than PASSENGER-CAR quality. Truck users want rugged stamina, for rigorous service! That is why you have lately seen in the truck advertising of some manufacturers so much talk of "all truck." They are aiming to satisfy the demand. But they are only now claiming what International Trucks have *delivered* for many years—EXTRA capacity for taking punishment and giving value. For more than twenty years the International Truck builders have built *only trucks*. No automobiles—no tempting opportunity to compromise. The new streamlined Internationals, with all their beauty of line, give you International ALL-TRUCK QUALITY. Sizes from ½-ton up, chassis f. o. b. prices from $390 up, at all International branches and dealers.

International Harvester Company of America, Inc.
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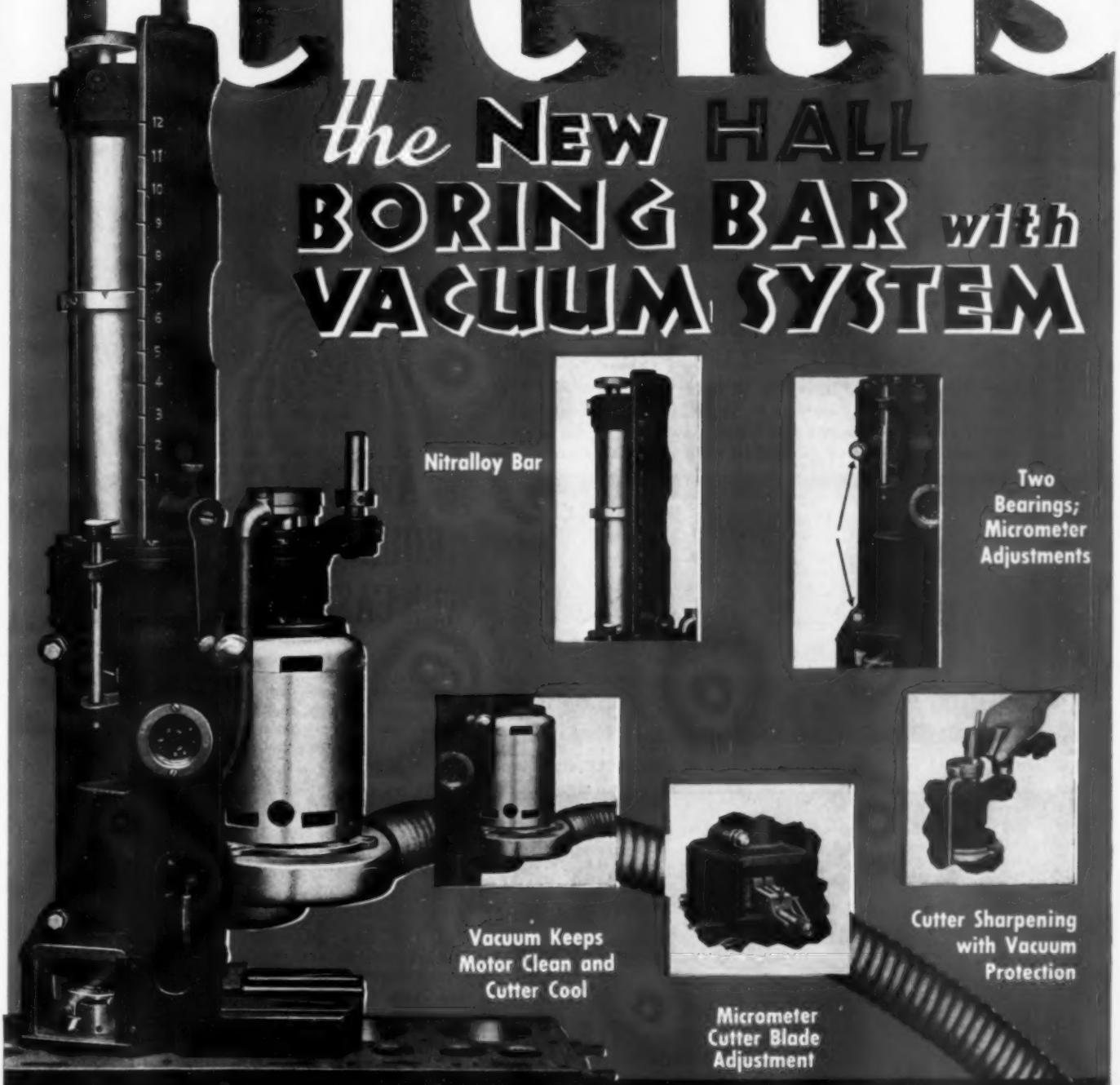
Here it is

the NEW HALL BORING BAR with VACUUM SYSTEM


Nitralloy Bar
Two Bearings; Micrometer Adjustments
Vacuum Keeps Motor Clean and Cutter Cool
Micrometer Cutter Blade Adjustment
Cutter Sharpening with Vacuum Protection

HALL BORING BAR with VACUUM SYSTEM

MAIL THIS COUPON FOR FREE DEMONSTRATION OR LITERATURE!

Hall Manufacturing Co., 1620 Woodland Ave., Toledo, Ohio

I am interested in your New Boring Bar with Vacuum System and would appreciate . . . ☐ Descriptive Folder ☐ Free Demonstration

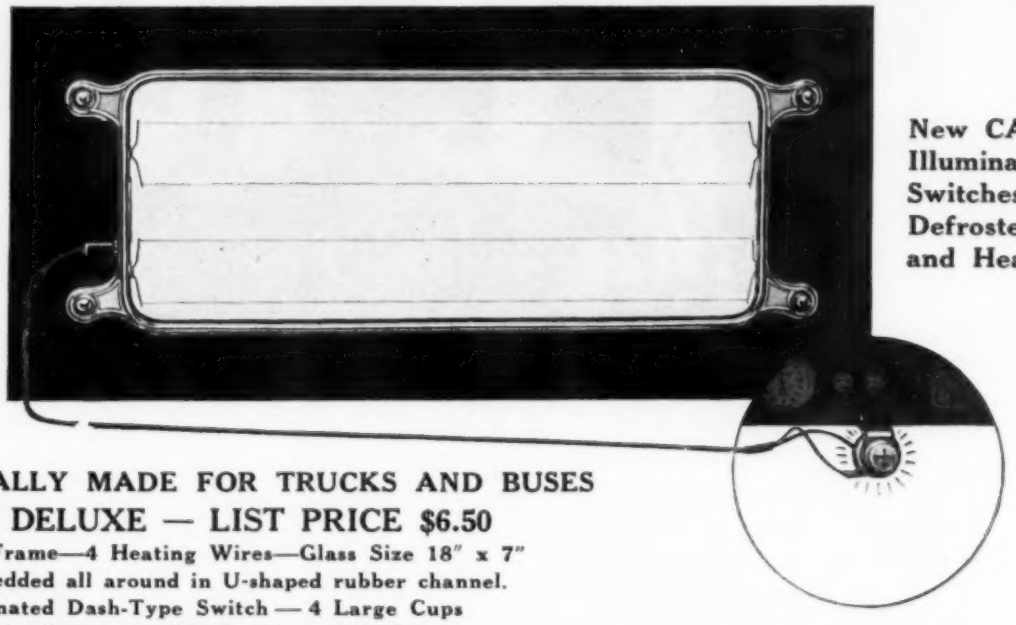
Name_____

Address_____ City and State_____

My Jobber is_____

"DON'T DRIVE BLINDFOLDED"

Patent Nos. 1,721,663, 1,681,443, 1,378,604, 1,754,669, RE 17,821, RE 19,145, Can. 324,421, Can. 310,978, other patents pending.

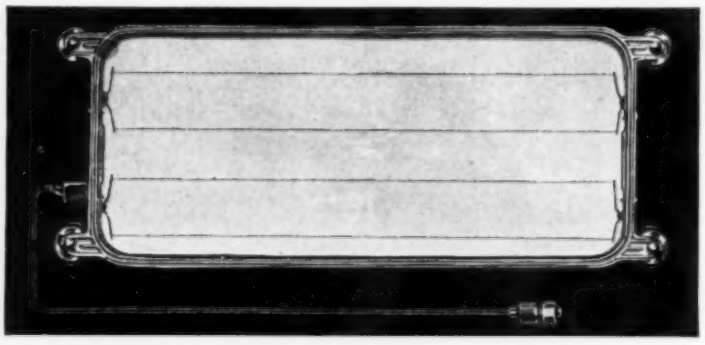


New CASCO Illuminated Switches for Defrosters and Heaters

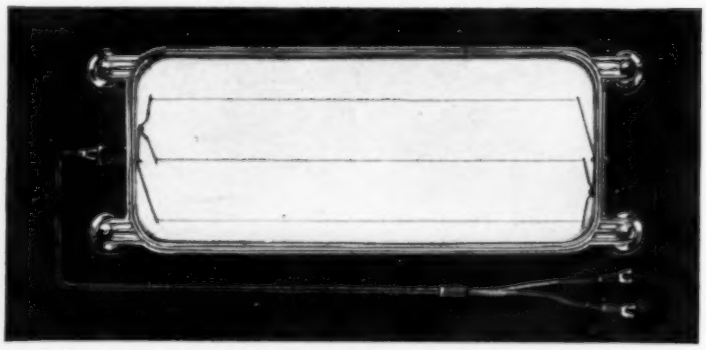
NEW—SPECIALLY MADE FOR TRUCKS AND BUSES

No. 50 DELUXE — LIST PRICE $6.50

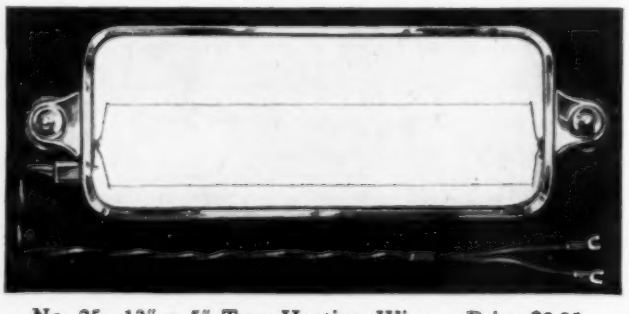
Chromium Frame—4 Heating Wires—Glass Size 18" x 7"
Glass embedded all around in U-shaped rubber channel.
Illuminated Dash-Type Switch — 4 Large Cups
Tube of adhesive furnished with each Defroster



No. 195—16" x 7" Four Heating Wires. Price $5.00.



No. 185—13" x 5½" Three Heating Wires. Price $3.25.



No. 25—13" x 5" Two Heating Wires. Price $2.25.
Three other models available for equipment.

CASCO PRODUCTS CORP., Bridgeport, Conn.

AVOID ACCIDENTS EQUIP YOUR FLEETS with CASCO DEFROSTERS

Every truck, bus and passenger car should carry a CASCO Defroster as necessary equipment, ready for instant use in sleet storms and heavy, wet snow. Makes driving safer, with less strain on the driver, and less lost time on schedules.

Their small cost is a real economy in time saved on schedules, as well as in avoiding accidents when the going is bad.

The new large No. 50 DeLuxe Model is specially made for trucks and bus equipment.

Other new improved 1934 CASCO Defrosters offer many distinct advantages.

No. 195 has an embossed frame, four heating wires and is furnished with plug and connector.

No. 185 has been enlarged and now has embossed frame and three heating wires to insure ample heat for coldest days.

No. 25 is a new two-cup model with chrome frame; an attractive, inexpensive Defroster.

CASCO offers a complete line of correctly designed Defrosters.

CASCO DEFROSTERS FIT ALL CARS, TRUCKS AND BUSES

Order From Your Wholesaler or Write us for Full Information.

CASCO
REG. U.S. PAT. OFF.
CLEAR VISION *for* WINTER DRIVING

VOL. 13
NO. 5

FLEET OWNER

NOVEMBER
1934

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(The Editor's Column)

POINTED PARAGRAPH

● "Truck and bus fleet owners are prone to wonder if the manufacturer is attempting to cheapen his car if something goes wrong when the speedometer shows 250,000 miles" . . . Such are the comments of a prominent truck engineer; some day in the not very distant future we are going to wholeheartedly subscribe to them. . . . When one fleet man recently reported 100,000 miles with no major overhauls, certain gentlemen in the fleet maintenance fraternity were overheard to say "Sez You" . . . Engineering and metallurgical research, coupled with field experience, are in no small way responsible for the improved truck and bus performance which all of us must be enjoying. Don't let anyone hear you say that they "aren't building them like they used to." For, even though you'll be correct, literally, you'll be taken up wrong and will be regarded as one who knows not whereof he speaks . . . All of which is just a very long-winded way of saying that today's trucks provide performance undreamed-of and unanticipated quality, consistent with low price. If you doubt us, just call in any of the leading truck manufacturers' new models and let yourself act as the judge and jury.

●

WHAT ENGINES FOR TRUCKS?

● Here's an interesting thought. A truck engine will not stand up if installed in a passenger car and subjected to ordinary pleasure car service. But a passenger car engine (in a truck) *will* stand up under today's most stringent trucking requirements. Such are the theories (*claims* would be a better word) advanced by an engineer of one of the "all three" manufacturers which makes both passenger cars and trucks. Far be it from us to disagree with him, since we've never converted a truck into a passenger car. But some of you fellows in the back seats will perhaps have something to say on the subject, inasmuch as you've been operating trucks with passenger car engines for many years. We'd be glad to hear from you on this subject. A controversy is something that we like to be mixed up in. When do we start?

●

THE BEST TEACHER

● At first blush the article appearing on page 20 of this issue might seem to be a glorified publicity article for a certain make of truck. Before you read it let us assure you that it is *not*. . . . It is just some first-hand *experience* information, offered unsolicited, by a good friend of ours who operates a fleet of these trucks. Not satisfied with certain of their shortcomings, he set out to correct them, and having done a job that worked out satisfactorily in his operation, he is glad to pass along the results of *his* experience, so that other operators might benefit. (Isn't that just like us?) . . . However, in all fairness to the manufacturer, let us state that these trucks, on the average, are probably ten years old, and it goes without saying that if these were newer models, such changes would hardly be necessary. As a matter of fact, we've already made the comparison, and the conclusion we draw is that Mr. Baggaley has done a creditable job of modernization at so low a cost. . . . After you read the article you'll no doubt agree that there is no better teacher than *experience*, after all.

●

WILL YOU BE THERE?

● If you are located within reasonable riding, walking or hitchhiking distance of Newark, N. J., we know that you'll attend the Transportation and Maintenance Meeting, sponsored jointly by the Metropolitan Section of the S.A.E., and the New Jersey Motor Truck Association. . . . To those who haven't been apprised of the meeting: The dates are November 8, 9 and 10, and the place is the Hotel Douglas, Newark, N. J. . . . During the meetings, an exhibition of automotive equipment, Diesel and Butane, Propane-burning units, streamlined vehicles, etc., will be held at the 102nd Armory in the same city. . . . No fleet operator can afford to miss this real treat. Papers will be read and discussions held on such interesting topics as: *Diesels for Fleets; the Use of Butane and Propane as Refrigerants and Fuels; Operation of the Code in the Trucking Industry; Taxation and Regulation as Applied to Highway Transportation; and others.* . . . The speakers will be prominent ones—men you all know. You don't have to be an S.A.E. member in order to attend. Sid Harris, Chairman of the "Met" Section, extends a cordial invitation to everyone in the fleet brotherhood, and we're glad to pass the good word along in this manner. Don't forget the dates, November 8, 9 and 10th.

●

HINT TO NOISY DRIVERS

● Elsewhere in this issue you will read about a large fleet of milk wagons in New York City being equipped with pneumatic tires. Rubber shoes are also being provided for the horses, so that Mr. New Yorker will not have his early morning rest disturbed. There's an opportunity for some bright columnist to remark "All they need to do now is to send the horses into the houses with the milk."

●

H. Clay Fischer
Editor

●

Analyzing a Typical Fleet Operation

This analysis represents a very complete survey of a Newspaper Delivery Fleet using vehicles of the type shown above. You will find it very thorough and perhaps can make use of some of the recommendations in your own operation. We are not permitted to reveal the identity of the operation analyzed, so to make it somewhat confusing, we have selected the above photo of a newspaper fleet, giving baseball news with two feet of snow on the ground. The trucks shown above do NOT belong to the fleet operation analyzed.—Editor.

●

By Everett J. Gribbons, M. E.

Article II—Cost Analysis of the Fleet

● (EDITOR'S NOTE: *The author of this article recently completed a thesis on the subject of Fleet Operation and Maintenance, which outlined in detail the operation, maintenance and cost accounting system in use by a New England newspaper fleet. In addition to presenting the experience data, he subsequently made an analysis, showed comparisons, pointed out probable savings and made specific and general recommendations, just as any industrial engineer or efficiency expert might do. We have broken this thesis down into a series of articles, the first of which covered maintenance practices and the author's recommendations. You've read it in our October issue. This second article covers a cost analysis of the fleet and presents certain definite suggestions as to how various costs might be reduced. You'll remember that the name of the fleet is a fictitious one, but that the data are facts, won't you?—H. C. F.*)

●

THE cost records as kept by the Combined Publishing Company do not present an accurate picture of the total cost of running each vehicle. The Company's records cover the cost of gasoline, oil, tires, repairs, rent and labor. The tire cost, for example, is inaccurate, since original equipment tires are *not* entered in the tire account, and tires subsequently charged to a vehicle are completely charged off at the time of application. This latter point may result in a vehicle bearing an abnormal tire charge for one period and no charge at all during a succeeding period.

The repair accounts include the cost of painting new vehicles with the fleet's distinctive color scheme; this charge should be added to the original cost of the equipment.

The monthly garage payroll is divided equally among all machines, and results in all vehicles bearing an untrue labor charge. Allocation of labor in this manner obscures the determination of the proper time to replace cars and does not disclose faulty vehicles. In addition, a new vehicle bears the same labor charge as the oldest, and, for example, a truck covering 50,000 miles per year is charged with the same amount of labor as a coupe that is driven but 15,000 miles during the same period.

The author has prepared individual cost records for all the vehicles now in active service, in order to present the truest possible cost picture of each machine. As an illustration of the method followed,

Car No. 1 Make Dodge Capacity or Type 1 Ton Purchased November 1930.

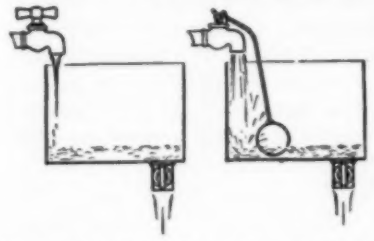
Total Investment		1312.50	Assume 4 year life.
Incl. Cost to Paint			Assume life mileage = 100,000
Deduct:			Depreciation per mile = 1052.50 / 100,000 = 1.052 c/m
Tires	60		
Salvage Value	200	260.00	Interest on investment @ 5% =
			1312.50 x .025 x 5/4 = 41.00 per year.
Amount to be depreciated		1052.50	

	EXPENDITURES IN DOLLARS.				COST PER MILE			
Year	1930	1931	1932	1933	1930	1931	1932	1933
FIXED EXPENSES								
Int. on Inv.	3.52	41.00	41.00	41.00				
Reg. & Taxes	6.52	37.70	38.33	8.15				
Ins. F. & Theft	.52	6.25	4.68	3.64				
P.D. & P.L.	12.10	171.40	157.00	158.20				
Collision	5.00	60.00	40.00	40.00				
W.L.N. & F.	12.68	157.87	153.16	156.90				
Adm. & Gar. O.H.	2.92	35.10	35.10	35.10				
Depreciation	30.00	424.00	222.00	165.00				
TOTAL FIXED EXP.	73.26	933.32	691.27	607.99		.0232	.0328	.0388
RUNNING EXPENSES								
Gasoline	29.78	428.78	328.66	261.52		.0106	.0156	.0167
Oil	2.73	51.66	46.48	31.59		.00128	.0022	.002
Tires	10.60	150.00	78.50	58.50		.00373	.00373	.00373
Repair Parts	14.91	163.08	226.33	91.09		.00405	.0107	.00586
Labor	26.56	317.42	297.91	316.65		.0079	.0141	.0202
TOTAL RUN. EXP.	84.58	1110.94	977.88	759.35		.0276	.0464	.0484
TOTAL EXPENSES	157.84	2044.26	1669.15	1367.24	.0554	.0507	.0792	.0872
Mileage	2834	40200	21033	15676				

Figure 1—Cost table for Truck No. 1. This is shown to illustrate the method followed in preparing cost tables for each individual vehicle of the fleet. Space will not permit showing all of these tables.

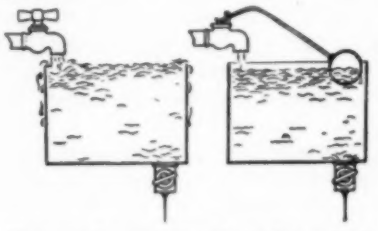
How a Large Dairy is Saving Maintenance Dollars

How the Bosch Volt-O-matic Generator Works



Here are 2 tanks, both nearly empty. The tank at left is receiving a smaller supply of water than is being drawn off. Therefore, sooner or later it will be empty.

The tank at right, however, is equipped with a regulating device which has opened the faucet wide, sending a much larger stream of water into the tank than is being drained off. Therefore, the tank will soon be full again.



Here are the same 2 tanks under another set of conditions. Although now filled, and the amount of drain greatly reduced, the tank at left is receiving approximately the same volume of water as when it was nearly empty. Therefore, the tank overflows.

The tank at right is also full, and here, too, the drain is reduced; but the regulating device has been at work, automatically closing the valve as the float rises, gradually reducing the amount of flow to a mere trickle. Therefore, the tank will not overflow.

Notice that the tank without a regulating device received too much water in one case, too little in the other. But in the controlled tank the regulating device in each case adjusted the flow to the amount of water required to compensate for the outflow. In the same way, the automatic voltage regulation of the Bosch Generator operates to adapt the flow of current to the battery's needs, thus preventing overcharging or undercharging of the battery.

. . . and how similar savings are available to bakers, brewers, coal companies, bus companies, any business operating one truck or a whole fleet.

A LARGE dairy had an expensive problem in connection with its trucks.

One group of vehicles is used for door to door delivery in the early morning—when running lights are necessary. They average from 100 to 200 stops within a few hours. Under these conditions the battery was discharging so much of the time that no ordinary generator could keep it properly charged. Repairs and replacement due to battery trouble were a costly expense.

Another group of heavy duty trucks is used for hauling milk from the country. They make daily trips of from 100 to 200 miles at high speed, and mostly with lights on. Here again ordinary generators were unsatisfactory because of their reduced output at high speed.

The answer to the problem was to equip these trucks with Bosch Volt-O-matic Generators.

Such conditions as these are made to order for Bosch Volt-O-matic Generators which protect batteries against overcharging or undercharging, as the illustration at left shows. These Bosch Generators end the danger, delay and expense of road breakdowns caused by hitherto unavoidable battery abuses. Battery repairs and premature replacements caused by overcharging or undercharging, disappear. Since the battery is always well charged, the starting motor cranks the engine at high speeds and assures a powerful starting spark — mighty important in cold weather!

Thousands of fleet owners are saving maintenance dollars with Bosch Volt-O-matic Generators. Full information about them will gladly be sent to you on request.

• *The makers of Bosch products have always taken pride in creating, designing, building and selling products superior to those commonly in use. Proven leaders in their fields, these products are built up to a high standard of quality and not down to a price.*

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PRODUCTS manufactured by ROBERT BOSCH A.-G., bear trademarks shown above. Sold by United American Bosch Corporation.

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- ☐ Bosch Volt-O-matic Generators
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- ☐ Bosch Neverstall Windshield Wipers
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- ☐ Bosch Rapid Transit Magnetos
- ☐ Pyro-Action Spark Plugs

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- American-Bosch Coils ☐
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WRITE NAME AND ADDRESS IN SPACE BELOW

Say "I saw it in FLEET OWNER"—It Helps!

ANALYZING A TYPICAL COST SET-UP (*Continued*)

a cost table of Truck Number 1 appears in the table (Figure 1) on page 14. Lack of space makes it impossible to show cost tables for the entire fleet, but the procedure is the same for all of the trucks and passenger cars.

In arriving at these cost figures, the actual purchase price of each vehicle was taken from the original purchase vouchers. The cost of initial painting in each case was deducted from the repair account proper, and added to the initial investment to give the total investment. A deduction based on an assumption as to the value of tires at the time of purchasing the vehicle, together with an assumed car salvage value, was used in determining the amounts to be depreciated.

The life of each vehicle was assumed and was based on yearly mileages in most instances. In cases where a truck was transferred from one type of service to another, the life mileage of the truck was assumed and a depreciation cost-per-mile figure derived.

Past experience of the fleet indicates that trucks used for city delivery have a lower life mileage than trucks used on long country routes; this accounts for existing apparent differences in assumed life mileages, which can be noted upon perusal of *all* of the cost tables. A depreciation charge based either on the life in years or miles was apportioned to each vehicle.

An interest charge was calculated, based on the formula:

$$\text{Interest per year} = I \times \tfrac{1}{2} R \times \frac{(n+1)}{n}$$

In the above formula, I = Total Investment; R = Prevailing Interest Rate (5% was used); n = Number of years over which equipment is to be depreciated. This formula is advocated by General Motors and is based on the assumption that depreciation is taking place at a uniform rate. The interest charge was included in order to afford a more accurate comparison between vehicles of high and low original cost, and because the author feels that if the purchaser borrowed the money, he would have to pay interest; or if his own funds were used, he would lose the interest they formerly paid, until invested.

Registration fees were calculated, and are based on actual rates. The cost of taxes was taken directly from itemized bills furnished by the City for the years 1930, 1931, and 1932, and calculated for the years 1929 and 1933.

Itemized insurance costs were not available at the company office; they were compiled with the help of the manager of the insurance company and are correct to within a fraction of a dollar.

Rent, Light, Heat and Power (R.H.L. & P.) are actual expenditures and were taken directly from the Company's records.

The amount included under Administrative and Garage Overhead is a conservative estimate and is made up of a yearly expense of $100 for depreciation of garage equipment, and $710 for portions of clerical and administrative salaries; the total amount of $810.00 being equally divided among the 23 cars included in the fleet cost analysis.

Gasoline, oil, repair parts, and labor sums were taken directly from the Company's records, with corrections in the repair parts figure for a cost-to-paint deduction.

Original equipment tires were included by the author in the tire account (an assumption based on the current market value of tires).

TOTAL COST PER MILE

TRUCKS

Truck No.	Cap.	1933 Make	1933 Mileage	1933 Cost per Mile	Truck No.	1932 Make	1932 Mileage	1932 Cost per Mile	Truck No.	1931 Make	1931 Mileage	1931 Cost per Mile
1. 17	1½	Reo	49642	.0464	17	Reo	48049	.0495	17	Reo	45639	.0457
2. 14	2	Reo	26007	.0485	9	Reo	38149	.0517	5	White	38877	.0498
3. 9	2	Reo	48489	.0487	5	White	48650	.0553	1	Dodge	40200	.0507
4. 3	1½	Reo	40452	.0514	18	Reo	14798	.0564	3	Reo	48508	.0517
5. 22	1	Reo	36002	.0515	8	Ford	14913	.0598	7	Reo	36472	.060
6. 5	1½	White	50881	.052	7	Reo	33132	.0606	2	White	46945	.0603
7. 18	1½	Reo	35634	.0543	3	Reo	40919	.0609	23	Reo	15721	.0698
8. 26	1	Reo	25379	.065	2	White	48489	.0633	6	Reo	27674	.0702
9. 8	½	Ford	22765	.0587	26	Reo	23575	.066	21	GMC	14495	.0745
10. 2	1½	White	20536	.0688	23	Reo	21769	.068	25	Reo	13093	.0833
11. 23	1	Reo	21558	.069	21	GMC	20017	.0735	22	Reo	12198	.085
12. 21	1½	GMC	19694	.075	1	Dodge	21033	.0782	26	Reo	12493	.0926
13. 25	1	Reo	18633	.081	22	Reo	18105	.0785	4	Reo	14038	.109
14. 7	1½	Reo	20633	.0840	25	Reo	18366	.081	24	Int.	2804	.116
15. 1	1½	Dodge	15676	.0872	4	Reo	18650	.0936				
16. 24	1½	Int.	12004	.106	24	Int.	12371	.099				
17. 6	1	Reo	10628	.119	6	Reo	15921	.101				
18. 4	1½	Reo	9900	.1295								

SEDANS & COUPES

1. 19		Ford	25451	.0428	10	Ford	14724	.0480	27	Chev.	3186	.075
2. 12		Ford	23998	.047	12	Ford	4047	.0513				
3. 11		Ford	16967	.0494	19	Ford	5599	.0538				
4. 27		Chev.	15998	.0655	27	Chev.	15518	.0620				
5. 10		Ford	13165	.069								

Figure 2—This table covers Total Cost per Mile and is made up from the individual cost records for each machine, a typical one being shown in Figure 1.

COST PER MILE FOR TOTAL FIXED EXPENSES

TRUCKS

Truck No.	Cap.	1933 Make	1933 Mileage	1933 Cost per Mile	Truck No.	1932 Make	1932 Mileage	1932 Cost per Mile	Truck No.	1931 Make	1931 Mileage	1931 Cost per Mile
1. 14	2	Reo	26007	.01743	17	Reo	48049	.0184	3	Reo	48508	.01735
2. 17	1½	Reo	49642	.0178	3	Reo	40919	.0184	17	Reo	45639	.0203
3. 3	1½	Reo	40452	.01845	9	Reo	38149	.0223	5	White	38877	.0217
4. 22	1	Reo	36002	.0204	5	White	48650	.0228	7	Reo	36472	.023
5. 9	2	Reo	48489	.0207	7	Reo	33132	.0233	1	Dodge	40200	.0232
6. 5	1½	White	40881	.0216	18	Reo	14798	.0245	2	White	46945	.0264
7. 18	1½	Reo	35634	.0234	8	Ford	14913	.0254	6	Reo	27674	.029
8. 8	½	Ford	22765	.0244	2	White	48489	.0254	23	Reo	15721	.0326
9. 26	1	Reo	25379	.0277	26	Reo	23575	.0288	21	GMC	14495	.0338
10. 2	1½	White	20536	.0298	23	Reo	21769	.0306	22	Reo	12198	.0366
11.23	1	Reo	21558	.0314	21	GMC	20017	.0322	25	Reo	13093	.0392
12. 7	1½	Reo	20663	.0318	22	Reo	18105	.0326	26	Reo	12493	.0416
13.21	1½	GMC	19694	.0324	1	Dodge	21033	.0328	4	Reo	14038	.0526
14.25	1	Reo	18633	.036	25	Reo	18366	.0364	24	Int.	2804	.0625
15. 1	1½	Dodge	15676	.0388	6	Reo	15921	.0408				
16.24	1½	Int.	12004	.051	4	Reo	18650	.0410				
17. 6	1	Reo	10628	.055	24	Int.	12371	.0616				
18. 4	1½	Reo	9900	.0645								

SEDANS & COUPES

1.19		Ford	25451	.01653	10	Ford	14724	.0154	27	Chev.	3186	.0314
2.12		Ford	23988	.0178	27	Chve.	15518	.0256				
3.11		Ford	16967	.0189								
4.10		Ford	13165	.0239								
5.27		Chev.	15998	.0246								

Figure 3—This table covers Cost per Mile for Total Fixed Expenses, made up from individual cost records for each vehicle of the fleet.

SKF EQUIPPED
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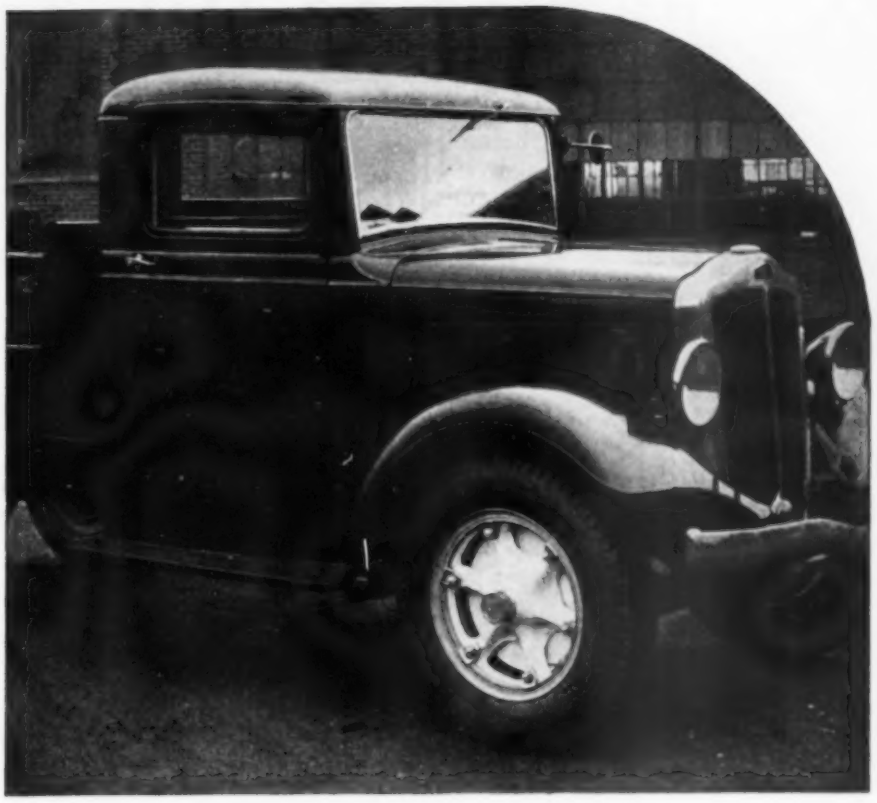

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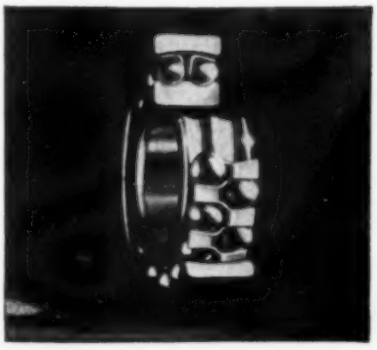

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Say "I saw it in FLEET OWNER"—It Helps!

A "HOW-TO-DO-IT" ARTICLE (*Continued*)

An estimate was also made as to the value of the tires on the equipment December 31, 1933, the final date included in the cost analysis, and the proper deductions were made. The tire charge for each vehicle was applied in the fairest manner possible; the trend of tire prices (taken from original vouchers) being considered at all times.

Yearly mileage totals were taken directly from the Company's records. The speedometers of five of the trucks were not in working condition and mileage assumptions were made by the garage foreman. These assumptions, with the exception of that for one truck, are fairly correct, for the speedometers were only broken recently and the trucks are on definite routes. However, the author considered the mileage as given, for one of the

COST PER MILE TOTAL RUNNING EXPENSES

TRUCKS

	Truck No.	Cap.	Make	1933 Mileage	Cost per Mile	Truck No.	Make	1932 Mileage	Cost per Mile	Truck No.	Make	1931 Mile-age	Cost per Mile
1.	9	2	Reo	48489	.028	9	Reo	38139	.0293	17	Reo	45859	.0254
2.	17	1½	Reo	49642	.0286	17	Reo	48049	.0311	1	Dodge	40200	.0276
3.	5	1½	White	50881	.0303	18	Reo	14798	.03185	5	White	38877	.0282
4.	18	1½	Reo	35634	.031	5	White	48650	.0326	2	White	46945	.0338
5.	22	1	Reo	36002	.031	8	Ford	14913	.0344	3	Reo	48508	.0344
6.	14	2	Reo	26007	.0311	23	Reo	21769	.0372	23	Reo	15721	.037
7.	3	1½	Reo	40452	.0328	7	Reo	33132	.0374	7	Reo	36472	.037
8.	8	½	Ford	22765	.0343	26	Reo	23575	.0377	21	GMC	14495	.0405
9.	26	1	Reo	25379	.0374	2	White	48489	.0379	6	Reo	27674	.041
10.	23	1	Reo	21558	.0376	21	GMC	20017	.0414	25	Reo	13093	.0438
11.	2	1½	White	20536	.0390	3	Reo	40919	.0424	22	Reo	12198	.0486
12.	21	1½	GMC	19694	.0426	25	Reo	18366	.0445	26	Reo	12493	.051
13.	25	1	Reo	18633	.0447	22	Reo	18105	.0457	24	Int.	2804	.0532
14.	1	1½	Dodge	15676	.0484	1	Dodge	21033	.0464	4	Reo	14038	.0568
15.	7	1½	Reo	20663	.0522	24	Int.	12371	.0474				
16.	24	1½	Int.	12004	.055	4	Reo	18650	.0526				
17.	6	1	Reo	10628	.0642	6	Reo	15921	.060				
18.	4	1½	Reo	9900	.065								

SEDANS & COUPES

1.	19		Ford	25451	.02630	10	Ford	14724	.0328	27	Chev.	3186 .0435
2.	12		Ford	23998	.02930	27	Chev.	15518	.03642			
3.	11		Ford	16967	.0305							
4.	27		Chev.	15998	.0410							
5.	10		Ford	13165	.0451							

Figure 4—Cost per Mile for Running Expenses is shown in this table, also prepared from the individual cost records.

TOTAL COST AND COST PER MILE FOR FLEET.

EXPENDITURES IN DOLLARS	1933	1932	1931	COST PER MILE 1933	1932	1931	% of EACH ITEM 1933	1932	1931
FIXED EXPENSES									
Int. on Inv.	913.68	834.25	621.58	.00157	.00169	.00165	2.6	2.6	2.7
Reg. & Taxes	502.89	595.42	540.87	.00087	.00120	.00145	1.4	1.8	2.3
Insurance	3935.77	3470.52	2548.28	.00678	.00698	.00685	11.1	10.7	11.1
R.L.H.&.P.	3413.49	2756.09	1917.91	.00588	.00555	.00515	9.7	8.5	8.3
Adm.&Gar.O.H.	766.30	631.83	426.11	.00133	.00128	.00115	2.2	2.0	1.9
Depreciation	5210.44	4984.68	3865.92	.00917	.01000	.01040	14.7	15.4	16.7
TOTAL FIXED EX.	14742.57	13272.72	9922.67	.02560	.02670	.02665	41.7	41.0	43.0
RUNNING EXP.									
Gasoline	8111.06	7418.04	4917.80	.01400	.01490	.01320	22.9	23.0	21.3
Oil	737.08	733.77	527.26	.00128	.00148	.00140	2.1	2.3	2.3
Tires	2274.55	2215.67	1885.45	.00392	.00445	.00504	6.5	6.8	8.2
Repair Parts	2614.39	3288.37	2008.57	.00452	.00664	.00536	7.3	10.4	8.6
Labor	6899.83	5333.34	3830.32	.01190	.01083	.01030	19.6	16.5	16.6
TOTAL RUN. EXP.	20636.91	19009.19	13169.40	.03562	.03830	.03530	58.3	59.0	57.0
TOTAL EXPENSES	35379.48	32281.91	23092.07	.06122	.06500	.06195	100.	100.	100.
Mileage	580112	496794	372343						

Figure 6—The Cost of Operating the Entire Fleet is shown in this table. Note the percentage figures for the various items.

trucks (Number 4) as being much too high, and assumed a lower mileage total for 1933, based on the gasoline consumption of that and similar trucks.

The cost per mile figures were calculated with the use of a slide rule. A slide rule is accurate to three places and is deemed sufficiently accurate for work of this sort. The cost per mile figures for individual running expenses (as shown in the typical truck cost sheet for truck Number 1) when totalled, in most cases will not agree exactly with the corresponding *total* cost per mile. It is difficult to make such figures agree when the work is done with a slide rule, without "doctoring" some of the numerals, and the author preferred to use the figures as calculated.

Statistical tables compiled from all of the cost data as calculated for each machine (and not shown in this article) are illustrated in Figures 2, 3, 4, 5 and 6. These are arranged in the order of their magnitude. When studying these, it should be noted that the trucks travelling less than 30,000 miles per year are used for city service, with the exception of Number 7; the other trucks are used on long country routes.

An analysis of the tables covering Total Cost per Mile (Figure 2) and Cost per Mile for Total Fixed Expenses (Figure 3) will show a

(*Please turn to page* 50)

COST PER MILE FOR LABOR

TRUCKS

	Truck No.	Cap.	Make	1933 Mileage	Cost per Mile	Truck No.	Make	1932 Mileage	Cost per Mile	Truck No.	Make	1931 Mileage	Cost per Mile
1.	5	1½	White	50881	.0062	5	White	48650	.0058	3	Reo	48508	.0065
2.	17	1½	Reo	49642	.00635	2	White	48489	.00615	2	White	48945	.00677
3.	14	2	Reo	26007	.00655	17	Reo	48049	.0062	17	Reo	45638	.0070
4.	9	2	Reo	48489	.00655	9	Reo	38149	.0065	5	White	38877	.0074
5.	2	1½	White	20536	.00774	3	Reo	40919	.0073	1	Dodge	40200	.0079
6.	3	1½	Reo	40452	.00781	18	Reo	14798	.0083	7	Reo	36472	.0087
7.	22	1	Reo	36002	.0088	7	Reo	33132	.0087	23	Reo	15721	.0151
8.	18	1½	Reo	35634	.0089	26	Reo	23575	.0126	21	GMC	14495	.0164
9.	7	1½	Reo	20663	.0151	8	Ford	14913	.01315	8	Reo	27674	.0170
10.	26	1	Reo	25379	.0125	23	Reo	21769	.0137	25	Reo	13093	.0181
11.	8	½	Ford	22765	.0139	1	Dodge	21033	.0141	22	Reo	12198	.0195
12.	23	1	Reo	21558	.0147	21	GMC	20017	.0149	26	Reo	12493	.0212
13.	21	1½	GMC	19694	.0161	4	Reo	18650	.0159	4	Reo	14038	.0226
14.	25	1	Reo	18633	.0170	25	Reo	18366	.0162	24	Int.	2804	.0282
15.	1	1	Dodge	15676	.0202	22	Reo	18105	.0164				
16.	24	1½	Int.	12004	.0264	6	Reo	15921	.0187				
17.	6	1	Reo	10628	.0298	24	Int.	12371	.0241				
18.	4	1½	Reo	9900	.0320								

SEDANS & COUPES

1.	19		Ford	25451	.01230	10	Ford	14724	.0133	27	Chev.	3186 .0243
2.	12		Ford	23988	.01520	27	Chev.	15518	.0192			
3.	11		Ford	16967	.0141							
4.	27		Chev.	15998	.01980							
5.	10		Ford	13165	.0241							

Figure 5—Labor Cost Per Mile has been broken down and appears as in the above table.

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Say "I saw it in FLEET OWNER"—It Helps!

How We Modernized Our Fleet of Old Macks

Here are some of the Macks which the author of this article has "modernized" from a standpoint of increased speed, at a cost of but $15 per truck. The "catch" in it is that the work was done at the time of engine over-haul and the $15 represents the additional outlay. All of which is very cheap, providing it works, and actual experience has proven that it does, on thirteen of them, at least—H. C. F.

By Ralph Baggaley, Jr.,

Supt. of Equipment, McCrady-Rodgers Co., Pittsburgh, Pa.

MANY fleet superintendents have a particular fondness for their old Mack AB's and AC's, in spite of their slow maximum road speed. For, to offset this deficiency, they seem to have that very desirable attribute of dependability, which keeps them "in the running" day-in and day-out.

We found ourselves in a similar position, and our only objection to the continued operation of our fleet of these trucks was their slow road speed. In most types of operation, this results in fewer miles per day or year, and consequently, higher operating costs per mile on such items as Drivers' Wages, Storage, and Licenses, when compared to new, higher-powered trucks.

We reasoned that if the speed of those old trucks could be increased to bring these cost items more nearly in line with the speed of new equipment, the other cost items, already favorable to the old trucks—namely, interest on investment, depreciation and frequently repair costs—would make the total cost figures favorable to the old trucks in a number of types of operation, particularly in ours.

With this thought in mind, the writer set out to devise an inexpensive method of obtaining more speed out of our fleet of old Macks. This called for more than merely the installation of larger front sprockets, or faster rear axle ratios, because while such changes increase top road speed, they at the same time decrease acceleration qualities and hill-climbing ability in each of the gears, so that in the crowded traffic and hilly country through which these trucks operate, very little could be gained through such a step.

Just to give you an idea of the hard usage to which this fleet is put, we have included this snap-shot of a part of the fleet working "off the road."

And sometimes they are called upon to play the role of amphibian, too, according to this picture. At any rate, the author assures us that they still "can take it."

The requirement of greater truck speed with no accompanying loss of acceleration or hill-climbing ability was met by us, through certain engine changes which permitted appreciably higher engine speeds and thus higher truck speeds in all the gears. Because of the fact that the factory-set governors were holding these engines down to what we considered very conservative ratings, it was possible to "rev up" these engines to higher governed speeds than originally specified, thus making available increased speed and horse-power development.

The chart which appears on the next page of this article, shows the horse-power and torque curves of, for example, the Mack AB engine, which is one of the types that we speeded up. You will note that the standard and optional factory settings of the governor were made at 1450 and 1800 r.p.m. respectively, and that the horse-power developed at these speeds is 50½ and 59½ respectively. By making the various changes which will be outlined in the succeeding paragraphs, we are getting 63 horse-power, for example, from engines of this type, at an increased speed of 2100 r.p.m.

To anyone unacquainted with truck engine specifications, it would seem rather dangerous to increase the governed speeds of truck engines beyond the manufacturer's settings. However, probably all of us have witnessed these trucks being overspeeded when going downhill in gear, *well beyond the factory-governed engine speeds*, and we also have noted that the major parts of these engines were quite generally unharmed by this practice.

Since it is an established fact that bearing loads are higher under such "motoring-over" conditions, than when the engines are "pulling" at similar speeds*, it seemed probable to us that these engines could be governed to run faster, successfully. (*Editor's Note: Engineering data substantiates this fact to our satisfaction.)

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"REVVING-UP" *the* OLD AB's *and* AC's *(Continued)*

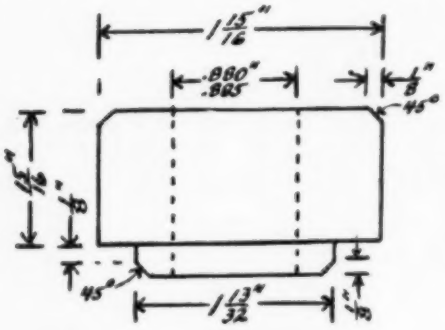


Figure 1—Working drawing of special circular steel spacing washer, made up to enable the use of shorter valve springs.

The first thing we did was to carefully consider such components as piston size, length of stroke, bearing areas, connecting-rod weights, crank-shaft diameters and similar pertinent factors, in direct comparison to those of present-day six-cylinder engines which are governed by their manufacturers at considerably higher speeds. It appeared entirely feasible, so far as the major parts were concerned, to run our four-cylinder Mack engines considerably faster, if we paid certain attention to comparatively minor design factors, such as piston weights, valve action, intake manifold heat, vibration of the motor base on two-block models, and the proper selection of governor weights and springs.

Accordingly, with these thoughts constantly in mind, the writer decided that an increase in engine speed of approximately 30 per cent would be practical, and we made the following changes in order to enable successful operation at the higher speeds:

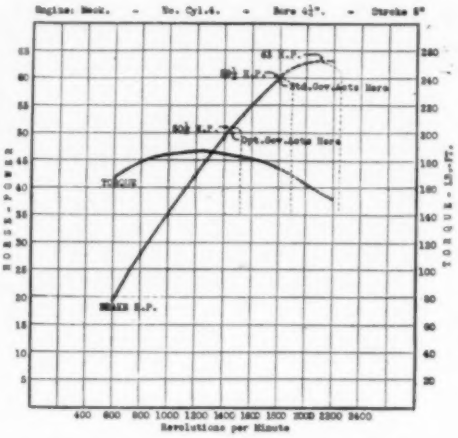
The Mack AC engine, 4-cylinder, 5" x 6", with blocks cast in pairs, was so altered that the governed engine speed increased from standard 1175, to 1575 r.p.m. The truck top-speed was increased thereby, from 18½ m.p.h. to 25 m.p.h., using *the same* 15-36 sprockets and 40" x 8" pneumatic tires. Engine changes were made as follows:

(1) Bearing loads were kept down by the substitution of conventional type aluminum pistons for the old-style, heavy-head, cast-iron pistons. Relative weights of the two piston, pin and ring assemblies are: Aluminum, 5.1 lbs.; Cast Iron, 10.2 lbs.

(2) Oil consumption at the higher speed was controlled through the use of one high-unit-pressure type oil control ring in a drilled bottom groove, two beveled-edge compression rings in the next higher grooves and one ordinary compression ring in the top groove.

(3) Valve spring breakage was avoided and faster valve action obtained through the removal of the long, old-style AC valve springs and the substitution of shorter, new-style AC or AK springs. A special spacing washer, illustrated in Figure 1, was made up and installed above each valve spring to compensate for the decreased length and to put them under proper tension.

(4) To stiffen the motor base and eliminate loosening of oil pan, cap screws ½" longer than standard



Typical h. p. and torque curves of Mack AB Engine, taken from official 1931 chart. Read text for details, please.

were used for bolting the oil pan to the motor base, and double nuts were used.

(5) To enable the governor throttle plate to remain fully open up to the higher engine speed, we removed the governor weights and reduced their weight by turning in the lathe, from 2.375 lbs. to 1.94 lbs. each. We also removed the old-style, light type governor springs and installed new, heavy type governor springs.

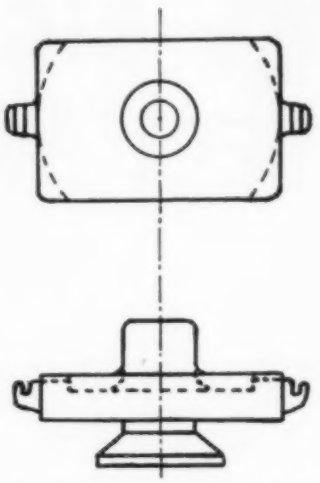


Figure 2—Governor weight from AB Mack, two views. Dotted lines show how these weights were lightened, by lathe turning.

The following changes were made to our Mack AB engines, which are four-cylinder, 4¼" x 5", single block, 9-stud head, with non-counter-weighted crankshaft, which increased the governed engine speed from standard 1600 r.p.m., to 2100 r.p.m., and thus increased truck top speed from 22 to 28½ m.p.h., using *the same* 16-48 sprockets and 36" x 8" pneumatic tires:

(1) Bearing loads kept down by substitution of aluminum pistons for the original cast-iron ones.

(2) Ring set-up used similar to that previously described for the Mack AC's.

(3) To avoid possibility of valve-burning, flat-seat valves were installed in the first two jobs built up. On later jobs, the angle seat valves were retained. These are working satisfactorily, although not with the exceptionally long life between valve-grinds, of the flat-seat valves.

(4) To avoid over-expanding of the mixture before entering the cylinders, in summer operation, the joint between the exhaust manifold and the intake manifold hot-spot was closed off by a thin steel plate. For winter operation a similar plate with a ¾" hole in it is used, to admit a limited amount of heat.

(5) To enable the governor throttle plate to remain fully open, up to the higher engine speed, we removed the governor weights and reduced their weight from 1.75 lbs. to 1.31 lbs. each. (A working

(*Please turn to page* 57)

Editor's Note:

IT is interesting to observe that the changes made by Mr. Baggaley are somewhat in line with those made by the manufacturer in later models of these trucks. For example, governed speeds of the newer models, according to the manufacturer's specifications, are practically the same as Mr. Baggaley now gets out of the older ones. Then too, the weight of the reciprocating parts mentioned is considerably lighter on the present-day jobs, than on the old ones mentioned in this operation. We also find that the crankshafts are now counter-balanced and compression ratios are higher. So we must compliment the author for his good sense in following, as far as practicable, the trends of present-day practice.—H. C. F.

NOT ONE SIDEWALL FAILURE WITH TRIPLE PROTECTED SILVERTOWNS

WE TESTED DOZENS OF TRUCK TIRES. ORDINARY CONSTRUCTION BROKE DOWN. NOT ONE TRIPLE PROTECTED SIDEWALL FAILED!
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Get this new tire . . . proved safer from "Failure Zone" Blow-outs

NO ONE ever built a truck tire like this before! Truckers everywhere had been complaining that their tires went to pieces in the sidewall. 80% of premature failures occurred in the sidewall "Failure Zone."

Goodrich engineers rolled up their shirt sleeves—went to work. They built an utterly different kind of truck tire. A tire with Triple Protection in the sidewall.

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1 **PLYFLEX**—a *new*, tough, sturdy rubber material with greater resistance to stretch. A layer of Plyflex in the sidewall distributes stresses and strains—prevents ply separation—checks local weakness.

2 **PLY-LOCK**—the new Goodrich way of *locking* the plies about the bead. Anchoring them in place. Positive protection against the short plies tearing loose above the bead.

3 **100% FULL-FLOATING CORD**—Each cord is surrounded by rubber. With ordinary cross-woven fabric, when the cords touch each other, they rub—get hot—break. In Silvertowns, there are no cross cords. No friction.

No Extra Cost

Why take chances when—at no extra cost—you can secure Triple Protected Silvertowns? See your Goodrich truck tire dealer today.

FREE! Valuable Book

A copy of the Silvertown Safety Manual for Truck Operators is yours for the asking. How to cut accidents. How to win free Safety Awards. Save money. Write Department T-155, The B. F. Goodrich Co., Akron, Ohio.

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FOR TRUCKS AND BUSES

Say "I saw it in FLEET OWNER"—It Helps!

The Case for "W" (Winter) Motor Oils

Since the Trend Is Unmistakably Towards Them, May We Present These Data on the Subject:

By H. Clay Fischer,

Editor, FLEET OWNER

IN July of this year we presented a story in behalf of lighter motor oils, the use of which is becoming more and more universal. Said story related how a fleet operator used the new type winter oils (20-W) for *summer* operation, and reduced his fuel consumption to such an extent that the increased oil consumption was economically outweighed. You will recall that his engines did not suffer undue wear because of the light oil, and that the oil did not "break down" in his most severe service. We also told you that it was the intention of this operator to continue to use 20-W oil during the summer months and change to 10-W for winter operation. In short, that article might also be summed up as "The Case for Lighter Motor Oils."

Many operators on whom the writer has recently called, do not yet seem to be convinced as to the effectiveness of lighter oils from a lubricating standpoint, and will stick to their S.A.E. 30 and 40 oils during the coming winter. (And how we hate the cold weather!) It is going to be a difficult job to "convert" them and since the trend *is* towards lighter oils, unless many of our leading automotive engineers are wrong, we're willing to "do our part" to help convince you that it costs no more to use low viscosity oils and that these oils do not add to the overall running expense.

It is unfortunate that many operators seem to entertain the idea that proper lubrication can be obtained only through the use of *high viscosity* lubricants. Many are still using the "finger test" to determine when oil is unfit for further use, and are actually *afraid* to use oil of light enough viscosity for winter work. And because of the fact that *oil mileage* comes in for its share of attention on the part of many fleet operators, heavier oils still get the preference in many fleets.

Granting that lighter oils will be consumed more readily, the savings in gasoline consumption should outweigh the additional oil consumed, if we are to put any stock in what Buick and Pontiac engineers tell us in Table I, appearing on this page. This table results from tests made, using several cars in the medium price range, made by different manufacturers. It shows, for a uniform sustained speed of 35 miles per hour, certain average values in oil and gasoline miles per gallon. In 10,000 miles of operation with lighter oils, you will note that there was an actual *overall saving* of $1.93. Unfortunately, they do not seem to mention the temperature at which these tests were made.

These same engineers claim to have pioneered the use of "W" oils during the winters of 1932-33 and 1933-34. They furnish the following simple and practical information to prove that 10-W and 20-W oils have excellent flow characteristics (and lubricating qualities) at extremely low temperatures, due to (not in spite of) their low viscosity as compared to other S.A.E. classification oils.

It might be in order to explain first, that the original S.A.E. viscosity classification was made by testing oils at a temperature of 130° Fahr., while "W" oils are tested at 0° Fahr. This more nearly approaches the temperature at which cold engines are started in the winter.

Thus, the decidedly advantageous viscosity of winter or "W" oils at low temperatures might lead to the

(*Please turn to following page*)

Temp.	Torque required ft. lbs. 10-W oil	Torque required ft. lbs. S A E 30	Torque available ft. lbs. from cold battery
60° F.	10	(25)	(82)
50° F.	13	28	80
40° F.	15	31	78
30° F.	20	38	76
20° F.	25	60	73
10° F.	32	108	69
0° F.	(45)	208	(62)

Table II—Showing the relationship of motor oil to electrical equipment. Note the marked difference in internal friction when the two different motor oils are used. This test was also made in a medium-priced car.

GAS and OIL MILEAGE TEST

(Medium-Priced Cars)

Mileage and Costs	With 10-W Oil	With S.A.E. 30
Miles per gal. of oil	1500	2500
Miles per gal. of gas	13.4	13.0
Gals. of oil per 10,000 miles	6.67	4.0
Gals. of gas per 10,000 miles	746	769
Cost of oil at $1.00 per gal.	$6.67	$ 4.00
Cost of gas at $0.20 per gal.	$149.20	$153.80
Extra cost for oil	$ 2.67	.....
Saving in cost for gas	$ 4.60	.....
Net saving per 10,000 miles	$ 1.93	.....

Table I—Showing the results of tests made by General Motors engineers, using several cars in the medium price range, at a uniform sustained speed of 35 m.p.h. Note the net saving, although the oil cost was higher.

"IT PAYS TO BE DIESEL-WISE"

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FOR LOWEST-COST TRUCKING

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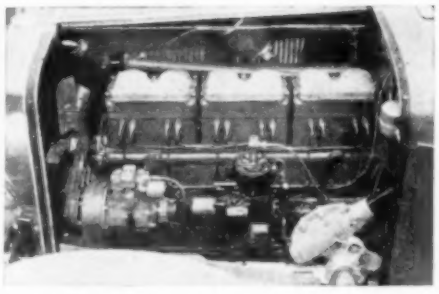
Millions of Miles of PROVED PERFORMANCE



6-cylinder CUMMINS DIESEL *in Ward-La France tank truck. Hauls 4250 gallons of gasoline at a fuel cost of approximately 4/5c per mile.*

QUICK FACTS

Every one of the first 100 purchasers of CUMMINS DIESELS for trucks has ordered from 1 to 71 additional CUMMINS DIESELS.

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After 3 years of operation, none of the earliest CUMMINS DIESEL ENGINES in trucks has been retired from service.

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Fully 95 per cent of all the Diesel-powered trucks in operation today in the U. S. use CUMMINS DIESELS.

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Based on average fuel costs, a CUMMINS DIESEL ENGINE will run a truck 500 miles for the *same* fuel cost of running the truck 100 miles with a gasoline engine.

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A CUMMINS DIESEL can be readily installed to replace the gasoline engine in nearly every kind of heavy-duty truck.

DIESEL-WISE truck operators *know* that the *proved performance* of Diesel power for motor trucks is clearly a record of achievement of CUMMINS DIESEL ENGINES—and *none other.*

In 1931, CUMMINS introduced Diesel power to the automotive world with the most sensational demonstration of performance ever conceived—a CUMMINS DIESEL car in the Indianapolis Speedway 500-Mile Race, a Coast-to-Coast Truck Trip in less than 98 hours running time, and a 14,600 Mile Non-Stop Truck Run under A. A. A. supervision. In each of these gruelling tests, the CUMMINS DIESEL ENGINE made amazing records for speed, endurance and fuel economy.

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MICHIGAN
Robt. Gotfredson Truck Co., Detroit

MISSOURI
Fleet Equipment Manufacturing Co., 7510 Washington Ave., St. Louis

NEW YORK
Cummins Diesel Engine Corp. of N. Y. 51 East 42nd Street, New York City
Gordon Motor Parts, Inc., 30 Joseph Ave., Rochester

OKLAHOMA
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Say "I saw it in FLEET OWNER"—It Helps!

THE TREND TOWARDS LIGHTER OILS (*Continued*)

erroneous opinion that these oils would break down at crankcase operating temperatures. Tests at *operating* temperatures have proven (these engineers tell us) that the difference in viscosity between S.A.E. 20 and the new 10-W oils does not vary widely. In support of this, the results of two particular tests are given, made on these two oils at *two* different temperatures.

The first test was taken at 60° Fahr. and the readings were 3,000 seconds for the S.A.E. 20 and 120 seconds for the 10-W. At this temperature, the S.A.E. 20 had internal friction, or resistance to flow, twenty-five times greater than the 10-W. This is graphically illustrated in Figure I on this page.

The second test was made at a crankcase operating temperature of 250° Fahr. At this temperature the S.A.E. 20 reading was 51 seconds as against 34 seconds for the 10-W. At *operating* temperatures the difference in internal friction or resistance to flow was greatly reduced, being only 1.5 as compared to 25.

Thus it will be seen that a heavy oil having 25 times the internal friction of a light oil will certainly offer more friction in the bearings and cylinders of an engine than the light oil on a cold start. But when the engine warms up to *operating* temperatures, the two oils will have nearly the same viscosity characteristics. Table 2 illustrates the difference in internal friction of two typical grades of oil covered in this discussion. (See preceding page).

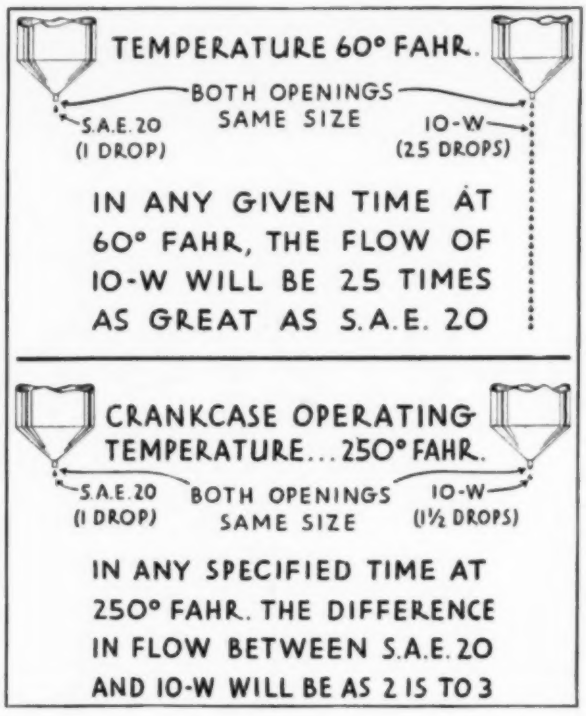

TEMPERATURE 60° FAHR.
BOTH OPENINGS SAME SIZE
S.A.E. 20 (1 DROP)
10-W (25 DROPS)
IN ANY GIVEN TIME AT 60° FAHR, THE FLOW OF 10-W WILL BE 25 TIMES AS GREAT AS S.A.E. 20
CRANKCASE OPERATING TEMPERATURE... 250° FAHR.
S.A.E. 20 (1 DROP)
BOTH OPENINGS SAME SIZE
10-W (1½ DROPS)
IN ANY SPECIFIED TIME AT 250° FAHR. THE DIFFERENCE IN FLOW BETWEEN S.A.E. 20 AND 10-W WILL BE AS 2 IS TO 3

Figure I—This graph emphasizes the easy flow of 10-W oils in comparison with S.A.E. 20 oil. Note that while there is considerable difference in flow at 60 degrees F., there is very little difference at crankcase operating temperature, or 250 degrees F. Leading oil companies are now featuring 10-W and 20-W oils, we understand.

The cranking effort required on a cold start very largely determines the ease of starting. A light oil of "W" classification requires *less* cranking effort, thus increasing the probability of a quick cold start. The common practice of the average driver, racing a cold engine during the warm-up period, tends to cause excessive wear when heavy lubricants are used. The greater fluidity of the light oil insures less wear, by allowing a more thorough lubrication of the engine parts during the warm-up period.

High speeds and resulting high temperatures, the engineers claim, are amply cared for by "W" oils. In comparison, "W" oils will give better lubrication over the entire temperature range, will increase gasoline mileage because of reduced "oil-drag," give faster acceleration and raise the top speed.

Notwithstanding the foregoing, we should be more interested in whether or not the oil will furnish *adequate* lubrication, rather than whether or not a few cents per 100 miles will be saved. This question is perhaps the one about which there is much doubt in the average man's mind, when it comes to the use of lighter oils. In this connection, it is interesting to report that many tests have been made during the last two years which prove without a doubt that cars can be driven *continuously* for thousands of miles at sustained high speeds, in high atmospheric temperatures, using low viscosity oils in the engines and without experiencing excessive wear or damage to any of the parts.

Some very interesting data are found in a paper entitled "Winter Oils for Automobile Engines" presented jointly by three engineers, at the Summer Meeting of the S.A.E., recently held. Let us quote a few paragraphs to substantiate the case for winter oils:

"A 20-W oil is usually recommended for most winter temperature conditions in temperate climates, and even though this is satisfactory, the lower viscosity of 10-W oil is needed during the occasional sub-zero spells for satisfactory starting. That 10-W oil is satisfactory during winter is evidenced by the experience of seven employees of the Chrysler Engineering Department who used 10-W in their personal cars this past winter. Most of the driving was done at moderate speeds, but the records show considerable driving done at 50, 60 and 70 M.P.H. The seven cars represent a total mileage of 18,595 miles, with an average oil consumption for the period of 3,686 M.P.G. Needless to say, no starting troubles were experienced.

"At the General Motors Proving Ground tests were run in August, 1933 on eight automobiles by different manufacturers. Oil consumption tests were made using five different oils. During this series of tests over 1,200 miles were driven at a sustained speed of 65 miles per hour for 100-mile test periods with a low viscosity index 10-W oil giving the lowest viscosity at the high operating temperatures which would be experienced with any of the commercial 10-W oils. All of these cars of eight makes operated satisfactorily on this 10-W oil (in August, 1933).

"A 1933 eight-cylinder car was then put on the road using 10-W oil, with instructions to the driver to operate at maximum speed as much of the time as possible. At the end of 1,500 miles the engine was still satisfactory but the test was then changed to a 1934 car of the same make as it was felt the information would be of more value. The test was discontinued at the end of 6,000 miles without any difficulty having been experienced with the 10-W oil.

"Two eight-cylinder cars were then put on the track on a 14,500-mile test on a schedule intended to represent the most severe owner-driver service. These cars were driven 600 miles per day, including 90 miles per day at 80 miles per

(*Please turn to page* 58)

Low priced . . Brilliantly streamlined . . Superbly built

ANYONE who knows trucks can see instantly that these great new Reos bring to the market something entirely without precedent in VALUES!

The ½-ton Speedwagon—new in the Reo line—has appearance and quality advantages that set it far apart from the field. Yet it is priced within a few dollars of the lowest!

The 1½-ton unit combines a gracefully streamlined exterior with quality features so extraordinary that any buyer who compares and analyzes should easily see the wisdom of investing the few extra dollars it takes to buy the Reo.

Both these new units, in fact, represent so much more truck for so little more money that good business judgment literally demands consideration of Reo before any decision is made on new equipment.

Thirty years of better-value-building laid the foundation for these new trucks—and they excel even the greatest Reo values of the past!

With the selection of a Reo comes the priceless advantage of Reo Ability Rating—the Exclusive Reo System that tells you in advance exactly what your truck will do. No truck today should be bought on any other basis by operators who are really interested in long life and low cost service.

A LOT MORE TRUCK FOR A LITTLE MORE MONEY

Next to seeing and driving the new Reo trucks, the simplest way of judging their exceptional quality is to compare them point by point with other trucks. With the Reo Extra Value Disc you can do this at a glance. Write us or ask your Reo dealer for this interesting disc and prove to yourself how much more truck you get when you buy a Reo!

** Special equipment extra, prices f. o. b. Lansing, plus tax. Myers Magazine Chassis Lubrication, standard on 2-5 and 4-6 ton models; slight extra cost on other models.*

STANDARD BODY TYPES FOR NEARLY EVERY BUSINESS

REO

MOTOR CAR COMPANY

LANSING, MICHIGAN

Say "I saw it in FLEET OWNER"—It Helps!

By G. E. Weaver,
Vice-President, Weaver Mfg. Co., Springfield, Ill.

Better Maintenance for Safety's Sake!

Is Compulsory Inspection the Solution to the Accident Problem? Here's One Authority's Opinion in the Matter:

EVERY operator of commercial vehicles recognizes that safety and maintenance go hand in hand, and that all fleet operators pay substantially for their accidents in settlement costs, operating interruptions and lowered efficiency.

In nearly every case those companies having the worst accident records are those whose vehicles plainly show that the management is not even on speaking terms with "Maintenance." Every bus or truck accident in which serious injury or loss of life is involved, gets front page publicity and jeopardizes your business, even though your equipment is in no way involved.

In the automotive industry there is too much "repair" and not enough "maintenance," and unfortunately, many fleet managers still do not realize the difference between repair and maintenance. The repairer fixes very little but the maintainer uses every means to *prevent* repairs. Maintenance, as we all know, should take care of the little things instead of allowing them to accumulate into heavy repair bills, interrupted operations and expensive claims.

It has been authentically reported that some companies make it so unpleasant for their drivers when they report poor brakes, bad steering or other defects that they hesitate to register complaints for fear of losing employment.

The problem of safe transportation on highways is not so much what a comparatively few safety-conscious, well financed and managed corporations can do, but what can be done through regulation to enforce safety maintenance and promote safe thinking among all motorists and fleet operators.

It is much easier to educate and impose safety regulations on drivers than on management, particularly the local managements of small fleets. Safety regulations have for forty years been imposed upon the railroads, without fear or favor, by the Interstate Commerce Commission and the railroads have benefited by that system of uniform inspection, which has made them the safest of all common carriers.

A challenge now appears to the automotive industry by the railroads who are already beginning to capitalize on the terrific death rate and cargo losses due to highway accidents, and new streamlined high-speed trains soon to be in operation on most class A roads will bid for the passenger and express business on the strength of safe operating records.

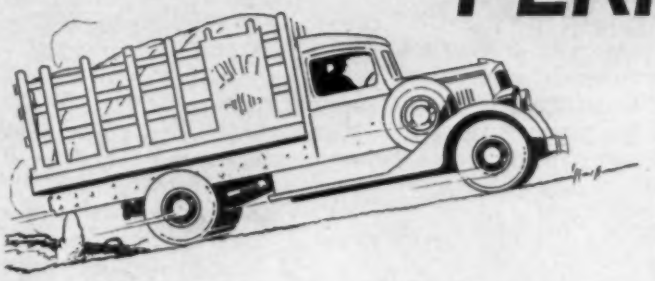
Even the Fire Department, as this picture shows, realized the importance of safety work, when their city recently put through a program of compulsory motor vehicle inspection. Here is the headlight test, and a part of the fleet can be seen lined up. Other tests included brakes, steering, horn, mirror, windshield wiper and similar necessities.

In one large city in 1932 a careful inspection of commercial vehicles, taken just as they came, showed that their brakes were only about 50% of what the manufacturer had provided and on the same inspection it was found that with little labor cost, the stopping efficiency could be greatly increased.

After the death of 5 people and the serious injury to a score more caused by the gas tank exploding on a beautiful chartered bus, the State called two of our engineers as the Governor's personal investigators.

It was found that the accident was caused by an excessive accumulation of grease and dust on the chassis, which was ignited by exhaust gases coming through a hole in the exhaust pipe that had been worn by the door-operating rod.

A NEW "HIGH" IN PERFORMANCE



A NEW "LOW" IN COST

PACKARD "440"

On the road and on the books, this new Packard "FOUR-FORTY" cable is *proving* its advantages. Fleet owners have found that it is making a record of performance unequalled in their experience. They have seen how it cuts down road failures, how it helps to keep more equipment in use and to maintain "on-time" schedules. They know, too, that this improved performance means *money saved.* They have found that the use of Packard "FOUR-FORTY" saves at least one out of every three ignition cable replacements.

There's a reason for the superiority of this new product. For Packard "FOUR-FORTY" is an entirely new type of cable. It is made from a secret-formula inorganic-base compound. It is a cable of BALANCED CHARACTERISTICS—built for all-round excellence. It offers a new and greater degree of resistance, not only to heat, but to high voltage rupture, oil, age and corona. It has practically obsoleted the lacquer-type cable for many kinds of use. If you are not yet enjoying this superior performance at reduced operating costs, equip one of your units with "FOUR-FORTY" now. We suggest that you see your jobber at once. Packard Electric Corporation, Warren, Ohio.

Packard
REG. U. S. PAT. OFF.
TRADE MARK

THE STANDARD WIRING EQUIPMENT OF THE AUTOMOTIVE INDUSTRY

Say "I saw it in FLEET OWNER"—It Helps!

MAINTENANCE *and* SAFETY JOIN HANDS *(Continued)*

Common sense should have dictated an occasional inspection from beneath by some other than a "grease ball." This was a preventable but expensive accident. A railroad along whose line this bus parallels showed how they scrape the accumulation of dirt and grease from beneath the high speed locomotives to detect flaws in the main frame members or to locate defective parts.

One answer to the "maintenance" problem might lie in state or city operated inspection bureaus, where all vehicles are required to appear at intervals for inspection.

Memphis, Tennessee is successfully operating such a bureau, where all motor vehicles are required to appear once in each six months for inspection and a fee of fifty cents is charged, which maintains the station and gives to the city a surplus to be used for further street and highway safety. It has resulted in a 25% decrease in fatalities and casualty underwriters have reported a very substantial decrease in property damage claims. (Editor's Note: For the benefit of other municipalities who might be interested, we will present a complete report covering the Memphis system in our next issue.)

Here is how they are doing it in Memphis, where compulsory motor vehicle inspection has recently been ordered. Note the separate "safety lanes" for passenger cars and trucks. This movement is attracting widespread attention and other municipalities interested in it will have an opportunity of reading all the details in a special article in our next issue.—H. C. F.

The station provides standardized inspection by trained operators. No repair work is done, no attendant is permitted to recommend any repair shop. The vehicle owner may go to any shop he chooses or, if capable, he may do the necessary correcting himself. If he wishes suggestions or advice on the safe maintenance of his vehicle, a competent supervisor experienced in automotive work is available.

It is gratifying to know that all high-class operators of commercial vehicles in that city backed the Commissioner in this venture. The largest oil company, the telephone companies, coal delivery companies, etc., not only urged it, but gave valuable advice and assistance in getting it started. And be it said to the credit of such companies that when defects in their equipment were found they were immediately corrected.

Fleet operators, especially those national in their scope having well managed maintenance departments, found little or no trouble at the inspection bureau.

But those organizations having shops of the "fix-it-up" type, or no shops at all, found their equipment in a great need of repair. This was particularly true of the owner-driver type of truck which accounts for 76% of all commercial vehicles. Many light trucks usually used for food delivery by the grocery store, or other establishment having one to ten trucks showed a lack of maintenance in any form and the dominating commercial vehicle traffic in any city is from such establishments.

About 375 vehicles belonging to all departments of the city were found to be below the average state of repair and much to the joy of the drivers all these vehicles were promptly put in good order. Fire Department equipment, however, was found to have brakes, steering gear, etc., in excellent condition.

It was interesting to note the reaction of truck drivers, especially those whose complaints of bad brakes and steering had fallen on deaf ears. One driver of a very large coal truck when informed that his brakes were very bad and differential gear grease could be seen oozing from one brake drum remarked, "Now, I know why my right leg feels like a stick of wood."

The inspection bureau provides that any vehicle after having been certified may appear for re-inspection any time for six months without cost; this encourages the free use of the station and no vehicle owner in the city can have any reasonable excuse for not knowing the condition of his vehicle. This feature is, of course, taken advantage of by every safety-conscious fleet operator, some making it a practice to inspect their equipment once a month.

Summing up the advantages to fleet operators, municipal or state inspection can provide:

(1) Either safe maintenance or removal from the highway of unsafe ramshackle vehicles.

(2) Standardized inspection of all used vehicles before being sold or delivered.

(3) Means of promoting safe driving education and dispensing safety literature.

(4) Making eyesight or color-blind tests.

(5) Increased driver morale and discipline.

(6) Safety testing facilities for the small fleet that can't afford a well equipped shop.

(7) A check by the management on their shop mechanics.

(8) Means of creating public good-will.

(9) Prolonged life of the vehicle.

Some small operators who at first objected to the bureau because of its small annual inspection charge, later stated that to know that their wheels were aligned over the equipment at the bureau saved much more than the inspection fee every year in tire wear. Many private car owners have also expressed this same practical reaction.

The bureau is operated on the basis that safety is something to be observed *not occasionally* but every day. It is therefore open every business day in the year.

During the first inspection period standards for brake equalization were set low, so as to avoid public disapproval by too many rejections and to give the shops an opportunity to train their help to adjust brakes on this low standard.

On the second period this standard was increased. This makes

(*Please turn to page* 61)

PLYMETL 'takes the Cake'

● Plymetl takes the cake, the bread, and the biscuits, too. In the broadest sense of the terms, it is the ideal body paneling since it is "lighter and stronger" and takes attractive finishes. ● Because Plymetl bodies are lighter, maintenance costs are lower, and since Plymetl is many times stiffer than any sheet metal of the same weight, it stands the gaff required in retail delivery. ● The Plymetl paneled bodies illustrated on this page are splendid advertisements for their owners. You, too, can have bodies like these by specifying Plymetl.

PLYWOOD HASKELITE PLYMETL

The above bodies are typical of Plymetl paneled trucks operated by leading bakeries. The builder, Luce Manufacturing Company, Lansing, Michigan, has standardized on Plymetl.

HASKELITE MANUFACTURING CORPORATION
208 WEST WASHINGTON ST. CHICAGO, ILL.

Say "I saw it in FLEET OWNER"—It Helps!

Pneumatic Tires for Milk-Wagon Fleet

•

Automotive Division of Borden's Converts Twenty Wagons in Metropolitan New York, as Noise-Reduction Experiment

•

By T. B. Stearns

TWENTY of Borden's milk wagons, equipped with pneumatic tires and drawn by horses shod with rubber-covered shoes, will soon be put into operation in the Metropolitan New York area as an experiment, it was recently announced by H. A. Cronk, president of Borden's Farm Products Company, New York City. The announcement was made at a demonstration of one of the milk wagons, in comparison with the familiar type of iron tired milk wagon, drawn by an iron-shod horse.

To the automotive bureau of The Borden Company at New York City, under W. R. Hall, director, was assigned the detailed study resulting in this curious combination of horsemanship and automotive engineering, W. P. Kearney being in active charge.

The newly-patented rubber-covered horse shoe which will be used, is only half the weight of a metal shoe and is expected to outwear the latter three to one. A thin metal insert is entirely covered by rubber so that no metal can possibly come in contact with the road. The covering is of new highly resilient rubber instead of the "dead" reclaimed rubber so generally used in the closed-bottom footpads with which some horses are rubber-shod.

Sound measurements made by engineers of Electrical Research Products, Inc. showed a reduction in sound pressure on the ear, in favor of the pneumatic-tired wagon with rubber-shod horse, of more than 90 per cent. This establishes a new record in the silencing of horse-drawn vehicles.

The use of pneumatic tires and rubber-covered shoes will have many advantages in addition to the reduction of the noise of before-dawn milk delivery, Mr. Cronk declared. Reduced wagon upkeep and the use of lighter weight horses are expected to be sufficient to offset the cost of equipment changes.

Milk delivery efficiency is also expected to be greatly increased, with fewer tie-ups in bad weather. Pneumatic-tired wagons have been found to skim over the surface of snow, sand and mud without sinking in as steel-tired wagons may do. Skidding also will be reduced, it is expected.

The use of smaller wheels has lowered the height of the milk wagon's floor eight inches, as shown in the illustration thereby lowering the step and affording lessened danger of accidents to milkmen in getting on and off wagons.

Wear-and-tear on axles, boxes, spring shackles, bolts, fifth-wheel circles and all other wearing parts connected with the gear of a wagon will be lessened by the use of pneumatic tires, it is anticipated.

The tires will be equipped with special inner tubes which, according to the manufacturers, will eliminate 95 per cent of puncture trouble. These tubes are equipped with double check valves which will extend the inflation period to possibly one month.

That rubber-covered horse shoes and pneumatic tires almost completely eliminate milk delivery noises was shown by acoustical tests. These revealed that the noise level created by the pneumatic-tired wagon with rubber shod horse was 28.4 decibels less than that of the steel-tired wagon with iron-shod horse.

This was the reduction when the horses drawing the new and old type vehicles were trotting. When the horses were walking, the reduction shown by the new equipment was 23.3 decibels.

"It was observed in these tests that with a standard steel-tired wagon, the major contributing source of noise was created by the impact of steel tires on the small irregularities of the concrete, brick or other road surfacing," said the report of the acoustical engineers. "In the case of the other vehicle, it was observed that almost the only source of noise was due to the almost inaudible sound

(*Please turn to page* 58)

New pneumatic-tired milk wagon of Borden's Farm Products Company, Inc. is shown in contrast with a standard steel-tired wagon. The horse hitched to the pneumatic-tired milk wagon is shod with rubber-covered shoes. This equipment for the first time reduces the early morning rattle and clatter of New York City's milk delivery by more than 90 per cent.

HAVE YOU EXAMINED BATTERY MAINTENANCE COSTS?

Operators of trucks and light commercial cars alike are finding that it pays to look into battery maintenance figures. Here is a fertile field for economies—these operators have discovered that maintenance costs are usually responsible for a large share of the total cost of battery service in a truck.

Battery maintenance pays—when applied intelligently and systematically—by greatly extending the life of a battery and by cutting down interruptions on the road, as well as delays in the garage. It pays extra dividends, too, as thousands of operators have learned, when the batteries are Exides. This is because Exides minimize the need for maintenance, and at the same time respond to reasonable care by delivering longer service at lower cost, with greater freedom from trouble.

Why not standardize on Exides, and cut down your own battery maintenance costs? Exide Engineering Service, conducted by trained and experienced battery engineers, is available to fleet owners, free.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

NRA CODE

Exide

BATTERIES FOR EVERY TYPE TRUCK

Exide Batteries for light trucks are now assembled in cases of entirely new design. Including important new structural features, these cases are even stronger and more durable than before.

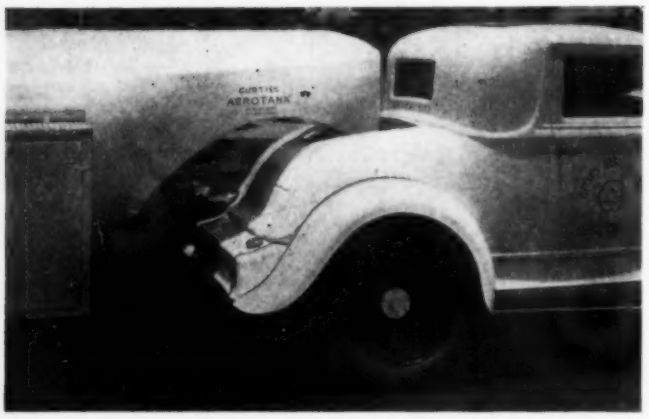
Say "I saw it in FLEET OWNER"—It Helps!

New Unit Has Chassis Inside *of the* Tank

Long and low—in keeping with modern ideas on design. Partly through skillful design and partly through aluminum construction, this tank-truck hauls a maximum of payload in keeping with wheel-load restrictions.

WITH the spectacular advances in passenger car design of the past three years, one is apt to overlook the equally extensive improvements in trucks. Developments in commercial vehicles are not always evident to the casual eye. Occasionally, however, a new design of truck is so revolutionary that it cannot help but catch the fancy quite as quickly as four-wheel brakes, knee-action and streamlining.

So it is with a new type of semi-trailer tank unit introduced by the Curtiss Aerocar Company of Coral Gables, Florida. By placing the structure which bears the load, *inside* of the tank, the chassis has been eliminated.



The king-pin is fixed in the nose of the tank. It is attached to a pneumatic coupling device located in the small pit in the rear deck of the tractor.

That sounds revolutionary, but it is only so in the sense that streamlining is revolutionary. True streamlining, with the big end toward the front, had been before the eyes of man for untold ages in the bodies of birds and fish, yet it passed before eyes that saw not; until the airplane was developed most "streamlining" followed the analogy of the axehead. Similarly placing the supporting structure inside of the tank instead of below is a relatively new idea because it had not occurred to anyone to use that inside space for anything but the liquid contents.

However, the Curtiss Aerocar Company realized that a frame placed inside the tank would lower the center of gravity by eliminating the chassis and would allow for a lighter tank as well, by acting both as a supporting structure and a four-point bracing system for the tank. Bulkheads and surge plates do the double duty of bracing the tank and of keeping the liquid cargo in the right place. The structural duplication and excess weight of the conventional chassis design are eliminated.

Through design alone the new type of trailer weighs one-third less than any truck or semi-trailer of conventional pattern made of similar material. But the designers did not stop with light-weight construction. In addition, they used a light-weight material—aluminum alloys—to effect another saving of about one-third. The entire semi-trailer unit is of aluminum with the exception of the wheel and axle assembly, the springs, spring hangers and the fixed king pin.

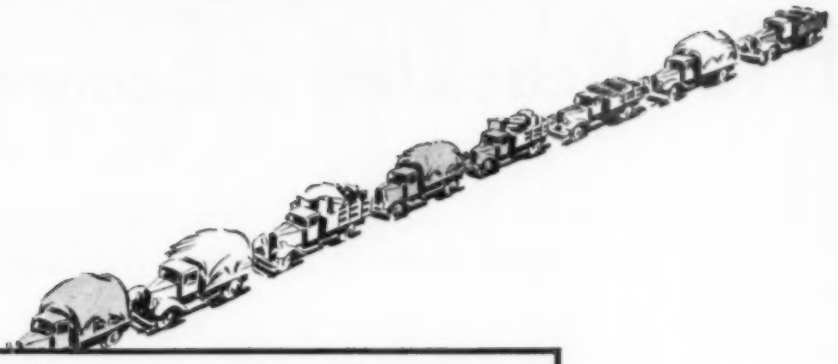
The tank is elliptical in cross-section with a major diameter (horizontal) of 54 in., a minor diameter (vertical) of 40 in. and an overall length of 16 ft. 10½ in. At the front end, the tank is tapered inward to a blunt point. The tank proper, the internal bulkheads and surge plates and the internal braces are assembled entirely by welding. The tank is divided into two compartments of 400 and 600 gal. capacity respectively.

An aluminum running-board 15 in. wide runs along the sides of the tank. Below it is a skirting containing compartments for 10-gal. oil cans and an enclosure for a Brodie meter and a hydraulic emergency valve. The latter is interlocked with the compartment door for additional safety.

The motive power is supplied by a special Reo tractor of the passenger coupe type. It is coupled to the Aerotank by means of an "Aerocoupler"—a device which in effect is a pneumatic universal joint. Its chief purpose is to eliminate the shocks of starting and stopping by interposing the resilience of a confined body of air

(*Please turn to page* 52)

This view from the rear shows the truck to be markedly wider than it is high. This was accomplished by placing the supporting structure inside the tank.



COMPLETELY PROTECTED

AGAINST FREEZING *and* RUSTING

WITH THE ANTI-FREEZE THAT GIVES FLEETS

MORE MILEAGE PER FILLING PER DOLLAR

The fleet owner who has thought the anti-freeze question *clear through* cannot fail to conclude that ZERONE provides the right answer. For ZERONE gives his fleet all the protection against freezing that any anti-freeze can; when used as directed, it protects down to *any* temperature. And, in addition, it protects against rusting and corrosion. Yet with ZERONE he pays no fancy price for this two-way protection. At the same time ZERONE does not readily evaporate . . . and maintains cooling system efficiency. Measured in terms of mileage per filling per dollar, ZERONE is undoubtedly the most economical anti-freeze preparation available to owners of fleets. E. I. du Pont de Nemours & Co., Inc., Ammonia Dept., Wilmington, Delaware.

Say "I saw it in FLEET OWNER"—It Helps!

Is Tire Retreading an Economical Procedure?

•

A Good Question You'll Agree; Here Is What Our Recent Question-of-the-Month Survey Revealed on the Subject:

•

By H. Clay Fischer,
Editor, FLEET OWNER

TO retread or not to retread; that is the question which we asked our readers to answer in the questionnaire appearing on page 45 of our August issue. Out of 100 fleet operators who cooperated with us and participated in this symposium, there were only 55 who have had *recent* experience with tire retreading. The other 45 operators all expressed a keen interest in the subject and seemed particularly anxious to learn what success other operators were having with this salvaging procedure.

All fifty-five of the operators who have used retreads have had this work done by outside specialists. Methods mentioned included the Hawkinson, Goodyear, Firestone, Heintz, Miller, etc. The cost of such retreading averages about 50 per cent of the cost of new rubber, some costs running as low as 30 per cent; others as high as 70 per cent.

Proper selection is one of the most important factors in retreading. The most minute examination must be made of all tires to be retreaded. If you know the past history of the tire, better still.

In some cases, mileages equal to the original tire are guaranteed; the average guarantee seems to be around 75 per cent, and in many cases no mileage guarantee is made —only the guarantee of satisfactory workmanship.

As to the mileages *realized*, while three operators reported getting 100 per cent of the original tire mileage, and two others reported 90 per cent, most of the answers ranged considerably below 60 per cent. From this we can reasonably conclude that in most cases, retreading is *not* an economical procedure under present tire costs. However, when asked point blank whether or not retreading *is* "an economical procedure," 25 operators answered that it was; 24 that it was not; and 6 did not feel qualified to answer this question.

Many remarks were made concerning the failure of retreaded tires to stand up under severe operating conditions, especially on long-haul work where trucks and tires were loaded to full capacity. In cases of this kind, the excessive heat which is generated on high-speed work seems to take its toll on retreaded tires. Highway work is a hard task-master and the concensus of opinion here is that retreads should not be used for this purpose.

Some operators did not hesitate to recommend retreads for city work, where loads were not too heavy and speeds not too great. Door-to-door delivery, such as in bakery and dairy fleets, perhaps constitutes the greatest market for the retreading specialist. Department stores, parcel delivery concerns and local expressmen should not be overlooked, either.

As to the types of difficulty experienced, most of the operators reported the failure of the new tread to stick to the carcass; this was by far the chief difficulty. Other troubles were really not the fault of the retreading process used, but rather were due to the operators' poor judgment in selecting tires for retreading. Attempts can be made to salvage tires that have breaks in side-walls, ply-separation, etc., but most of these will be futile.

It cannot be too strongly emphasized that only tires that are visually perfect, both inside and out, should be retreaded, if retreading is at all considered by you. It is sometimes difficult to *see* flaws in a used tire; there may be considerable inside rot and other damage caused by continual running in an under-inflated condition.

A tire might be selected for retreading that *looks* perfectly all right; it might be given a first-class, factory-type retread job, and might still fail to render a reasonable amount of service. It is therefore important that the operator *know* the complete history of each tire before slating it for a retread job.

There are many "recapping" jobs being offered at the present time. Opinion seems to be divided on whether to put new rubber on the side-walls as well as the tread. We have seen many satisfactory retreads.

In this connection, the experience of United Parcel Service of New York will be of interest. In an interview on the subject recently, Joe McLaughlin, of that organization, told us that they have had recent experience with retreading and that most of this experience was favorable.

It is his opinion that a standard-sized tire, used on the job for which it was designed, will be completely

(*Please turn to page* 52)

POWERFUL TRU·STOP EMERGENCY BRAKE

"Brakes did not work"—there is no way to get around that alibi. When true it means danger to property, if not to life and limb. The wise owner of truck or bus installs Tru-Stop Emergency Brakes for these good reasons:

1—Tremendously powerful—300 to 1 Leverage.

2—Stoutly built to stand abuse.

3—Simply, quickly, accurately adjusted by any mechanic or driver.

4—Shoe replacement made with equal ease.

Tru-Stop Brakes are adapted to all standard makes of transmissions or can be mounted on frame cross-members. Double shoe for heavy service, single shoe for light service.

No lengthy or expensive servicing.

AMERICAN CABLE COMPANY, Inc.
AUTOMOTIVE DIVISION • BRIDGEPORT, CONNECTICUT
12-251 General Motors Building, Detroit, Michigan
An Associate Company of the American Chain Company, Inc.

Say "I saw it in FLEET OWNER"—It Helps!

The TROUBLE SHOOTER

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

A Good Question—But YOU Answer It

Question: I would like information about the following: "How large a combination could we use and still be within every state law?"—L. P. J. S., Minneapolis, Minn.

Answer: Rather than attempt to figure this out, with all the exceptions, ifs, ands and buts, we are sending you by mail a copy of a booklet entitled "Truck and Trailer Size & Weight Restrictions."

Careful study of this book will reveal all of the restrictions and you can ascertain just how far you may go with respect to length, width, height and weight.

A single unit, for instance, in our "all-state" vehicle, could not be more than 26½ feet long to operate in Kentucky; not more than 84 inches wide for Florida's highways; and not more than 11 feet high to pass the law in Oregon.

A tractor-semi-trailer job could not be more than 30 feet long in the States of Kentucky and New Hampshire; width and height restrictions as above. And if you chose a full-trailer job, you could not operate it at all in Kentucky. So there you are.

As to weights, we will not go into this question, due to the variance in laws, axles used, axle spacing, etc. Better consult the booklet and have your vehicle built according to the requirements of the states in which you will operate.

(Editor's Note: Undoubtedly other operators will find the above-mentioned booklet of value. It's complete and concise. It covers the laws of every state in the Union and to make it authentic, each set of state laws is countersigned by a state official. We still have a number of copies of this booklet on hand, and will be glad to send them out, to fleet operators, without charge. Address the Editor, and ask for the "Size and Weight Restriction Booklet." First come, first served.—H. C. F.)

You May Not Believe It!

(But It's True)

THE FACT:

OLIVE OIL is a good lubricant for internal combustion engines and when so used, the consumption of both oil and gasoline may be noticeably lowered, and better motor operation will result.

THE PROOF:

OLIVE OIL is coming into use as a lubricant for internal combustion engines, as the result of three years' experimental work by the Institut Agricole d'Algerie, according to a recent report credited to Vice-Consul Joseph I. Touchette in Algiers, appearing in AUTOMOBILE TOPICS. The institute is said to have recommended olive oil for lubricating purposes on the condition that the oil contains no sulphur; that its acidity content is not more than 0.8 oleic degree; that a change of new oil with a complete flushing be made every 1,200 miles for automobiles, trucks and buses and every 40 working hours for tractors; and that the oil filter be cleaned every 300 miles in automobiles, and daily in tractors. A reservation states that olive oil is not suitable for engines that have a tendency to become gummy about the piston rings. Practical experiments brought forth the statement that motor operation was superior when olive oil was employed, and that the consumption of both oil and gasoline were noticeably lowered.

Cut Down the Pump? Don't EVER Do That!

Question: We have in our fleet a Nash Eight, 1930 Model, with which we have continuous overheating trouble. The thermostat has been removed and we are getting clear circulation through the motor block. The circulation seems to complete itself at low speeds, but at high speeds it does not seem to circulate at the bottom of the radiator, and at the same time it maintains a high pressure at the top of the radiator.

We have checked thoroughly and rebuilt the pump. Is it possible that the pump circulation is too great for this cooling system? Could it be cut down to a normal flow by changing the impeller in the pump? This radiator has a small core, tubular type radiator.—W. J., Baltimore, Md.

Answer: From your description we assume that the radiator core is clogged to such an extent that the water does not pass down through it at higher speeds. We would *not* advise you to cut down the capacity of pump by altering the impeller. Rather, you should try to clean out the core so that all of the water delivered by the pump will pass down through the radiator quickly and freely.

Since this is a tubular type of radiator, we would suggest that you remove it from the car and have the tanks taken off the top and bottom. You can then run wires or rods down through each tube of the core and clean them out. Before doing this, however, you might try cleaning out the core with radiator cleaning compounds; also by the reverse-flush method.

This procedure should solve your overheating problem and give proper circulation. As to changing the design of the pump—"Don't EV-ER Do That!" as Joe Penner would say.

TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

Taxi Information for Municipalities

Question: Please advise if you can furnish us with the following information concerning the inspection of taxicabs operating in municipalities, where there is strict mechanical inspection of cabs before issuing licenses to operators. How often are these inspections made? By whom made? Are fees charged for this service? Can you give us a sample of the inspection forms used?—M. A. H., Macon, Ga.

Answer: We are passing on to you the procedure as practiced in New York City. When a new taxicab is issued a hacking permit, it is inspected very thoroughly by the Hack Bureau of the New York Police Department, and is then inspected every three months thereafter during its use as a taxicab. Inspections are made as to mechanical condition, appearance and sanitary condition of the interior. The taxicab fee, paid to the city annually, is $10.00 per vehicle.

A printed form is used by the Police Department for making these inspections, which we understand are very thorough. We have not been able to obtain one of these, but if you will write to Captain Berkery, c/o Hack Bureau, Police Department, 156 Greenwich St., New York City, we believe he will be glad to send you a sample of the form used.

●

Good Automobile Text-Books Wanted

Question: Will you be good enough to recommend to me any books on the subject of parts and repairs on automobiles and trucks. We do not mean magazines, but text-books.—M. S. B., New York, N. Y.

Answer: There have been many books published on the subject of automobile and truck repairing. No recent ones have been called to our attention, and we are inclined to believe that there is no such thing as an up-to-date book on this subject. (Correct us if we are wrong, please).

Due to the rapid changes which have been taking place in our industry, it has been very difficult to bring out anything of this nature. The cost of such work is quite great, and in many cases by the time the book is published, the material in it is obsolete.

There are many good text-books on specialized subjects, such as ignition, carburetion, lubrication, etc., but one on general auto and truck repairing has been very difficult for us to find.

●

What Mileage Do You Get NOW?

Question: We have an Oakland 1931 V-8 sedan in our fleet, on which was averaged but 10½ miles per gallon for the first 10,000 miles. Is there any way that this mileage may be increased, or is this performance about right for this model?—J. W. H., Eau Claire, Wis.

Answer: The mileage which you mention is quite low, we believe, especially for the first 10,000 miles. Although the factories do not guarantee any definite m.p.g. figure, we should have expected you to get 14 or 15 m.p.g., especially when the vehicle was new.

Now that your car is practically three years old, a more important question is "What mileage are you getting now?" If this vehicle has been operated continuously and has not had any major engine reconditioning, the condition of the valves, piston rings and ignition apparatus would preclude the possibility of greater m.p.g. at this stage, unless some work were done.

We are also wondering whether or not any gasoline is finding its way into the crankcase? The writer has seen a few cases of this kind on the car in question, the gasoline overflowing from the carburetor and entering the crankcase through the valve covers.

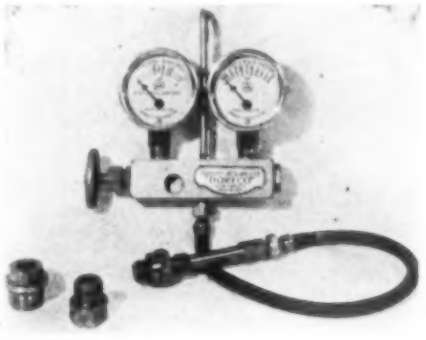
There is also the possibility of a fouled plug, which might not be so noticeable on an eight-cylinder engine. This would cut down your fuel mileage somewhat, we believe. If you will let us know what mileage you are *now* getting, perhaps we can offer some more constructive advice.

●

Compression Tester Shows Up Many Faults

ON page 36 of last month's issue, comment was made regarding the use of compression gauges for determining the condition of piston rings, in which the effectiveness of this practice was questioned. It was presumed that the term "compression gauge" referred to the common type of air-gauge, which shows pounds per square inch air pressure, and that this would *not* be confused with special devices designed for the particular purpose of indicating compression leakage.

As an example, we illustrate and describe herewith, one of the latest scientifically-developed instruments, especially designed for this purpose. Surely, one would *not* class this with the ordinary type of air gauge.



This device is called the "Compression Leakage Tester" and is used by Cities Service engineers, who developed it, in conjunction with the well-known "Power Prover Tune-Up Service."

It consists essentially of a calibrated orifice, one side of which communicates with a chamber in which a constant pressure is maintained by means of a regulating needle valve and a gauge situated on the left side, specially calibrated for various engine bores. The other side is connected to the cylinder to be tested. The leakage in this cylinder, past piston and valves, determines the pressure which obtains on the downstream side of the orifice, which is measured by the right hand gauge shown in the photo. This gauge has an arbitrary marking which defines the condition of the cylinder tested as good, fair, or poor, depending upon the pressure that the cylinder is able to maintain.

When properly used, this tester will show up leaky gaskets, faulty exhaust or intake valves, leaky piston rings, cracked cylinders, tapered cylinders, and many other things that the steam-fitter's gauge will not do. We hasten to explain the above, lest an incorrect impression be created.—H. C. F.

as WE GO to PRESS

(News of the Truck Industry)

New Name for N. A. C. C.

HENCEFORTH the National Automobile Chamber of Commerce will be known as the "Automobile Manufacturers Association." In voting for the change, the members believed the new name will more clearly indicate the composition and functions of the organization and prevent confusion with other organizations or chambers of commerce here and abroad. Alfred Reeves, Vice-President, makes this announcement. Headquarters are in New York City.

•

Gets Million-Dollar Order

AN order for 399 trucks, cabs and bodies totalling close to a million dollars has recently been awarded by the War Department to the Federal Motor Truck Company, Detroit, Mich., according to announcement made by M. L. Pulcher, president. The trucks, all of 2½-ton capacity, will be of special 4-wheel drive design, built to government specifications. The entire cab and body equipment will be built in Federal's own body shop, the announcement states.

•

Poxson Directs Reo Exports

REO'S Export Department is to be under the supervision of Elijah G. Poxson, president of the Reo Sales Corporation, according to a recent announcement made by D. E. Bates, President of Reo.

•

Jenkins Joins Marmon-Herrington

THE appointment of George E. Jenkins as district manager for the Marmon-Herrington Company, Inc., in the states of Texas and Oklahoma is announced by Bert Dingley, vice-president in charge of sales. Mr. Jenkins assumes his new job with a long record of experience in the all-wheel drive vehicle field, having been affiliated with the Four Wheel Drive Auto Company for sixteen years. Headquarters will be maintained at 3140 Hermosa St., Fort Worth, Tex.

•

Dates for Joint Trade Show

PERHAPS we forgot to mention it, but here it is. The dates for this year's Joint Trade Show, under the auspices of the N. S. P. A., M. E. M. A. and M. E. W. A., are November 19th to 23rd. The place is Cleveland, Ohio, and the location is the Public Auditorium. If you can attend, you'll see the latest in parts, accessories and shop equipment.

New York Auto Show Dates

DATES for the New York Automobile Show have been definitely set up by the Automobile Merchants Association of New York, under whose auspices it will be held. The same period as in former years—January 5-12—will see the big exhibition at Grand Central Palace.

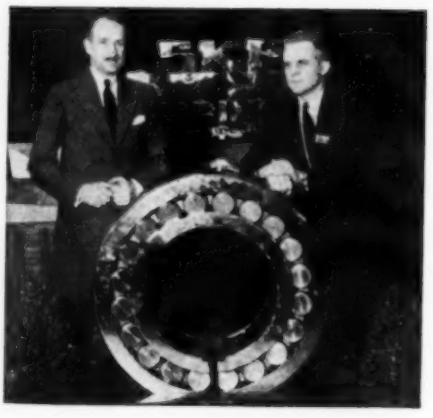
•

Truck Exhibits at N. Y. Show

A DEMAND far in excess of the space available developed at last month's drawing for positions at the New York Automobile Show. All American passenger cars were allotted space on the first and second floors, with outstanding truck exhibits on the third floor to be made by Chevrolet, Ford, Dodge, Reo and Terraplane.

•

This Won't Fit YOUR Vehicles



THIS 1,500-lb. self-aligning roller bearing is the answer of SKF to industry's demand for large heavy-duty bearings, say Messrs. R. H. DeMott, sales manager (left) and Robert C. Byler, advertising manager (right). This picture was taken at the recent Cleveland show conducted by the National Association of Motor Bus Operators.

•

New Warehouse for Toledo Products

THE Toledo Steel Products Company, Toledo, Ohio, announces a new jobber warehouse in Detroit. Complete stocks of Toledo superforged valves, valve guides, valve seat inserts, valve springs, valve stem keys, chassis bolts and bushings and water pump parts are carried by "Jobbers Warehouse," 660 Antoinette Avenue; W. H. Copher is manager.

New N. Y. Location for Stewart

STEWART Motor Trucks, Inc., Long Island City, N. Y., have recently moved into new quarters at 32-37 to 32-45 Queens Boulevard. The entire building will be occupied, it is announced, to be used as a retail sales and service location. The ground floor will be used to display and store new trucks and to house the service department. The second floor will be given over to parts storage and to the offices.

•

Cummins Diesel N. Y. Office

THE Cummins Diesel Engine Corporation of New York has recently been incorporated to represent the Cummins Engine Company of Indiana in the New England States, eastern half of New York and the eastern half of Pennsylvania; also the entire states of New Jersey, Delaware and Maryland. The new corporation will extend franchises to dealers in the principal points throughout its territory. The territory within a radius of 50 miles from New York City will be handled by the local office, both as to sales and service. A transportation engineer is included in the sales staff, to render competent advice on the subject.

•

Studebaker Personnel Changes

SEVERAL changes in personnel of sales executives were announced last month by Studebaker Sales Corporation. J. L. Engels has been transferred to the position of district truck manager, Cleveland branch. H. O. DeBoer comes to the home office truck division as special representative. Jay Rathbun has been appointed district truck manager at Atlanta. E. J. Frederick goes to the St. Paul branch. H. R. Perkins and J. M. Foster, former district truck managers, have resigned.

•

New Model "Dispatch-Tow"

A NEW "Dispatch-Tow" is announced by Indian Motorcycle Company, Springfield, Mass. This three-wheeled vehicle, introduced two years ago, was designed to reduce the cost of picking up and delivering cars, as it facilitates the return of either the driver alone, or the driver with the car, to the garage. The new job has a 2-cylinder, 45-cu. in. air-cooled engine, with dry-sump lubrication. Two styles of bodies are available, with a compartment for tools, accessories and batteries. Details on request.

The "jams" you'll keep your trucks out of will pay for

BENDIX

POWER BRAKES

YOU have only to *avoid* one small repair job, to more than pay for the permanent protection of Bendix B-K Vacuum Power Braking.

Of course, your drivers have plenty of muscle. They can tramp down on a brake pedal as hard and fast as necessary. But they *do* get tired, and when a man gets just so tired, he slows down. That's when the trouble comes.

State after state—city after city—has passed truck and trailer brake laws which nothing short of genuine Bendix B-K Controlled Vacuum Power Braking can comply with. Why not give your trucks and trailers the benefit of this time-proved muscle-saving stopping equipment *now?* You'll save money—and worry.

Bendix *alone* offers you *controlled* Vacuum Power, which avoids sudden, lock-wheel stops by providing what is known as "reactionary cushioning." The driver's "pedal feel" is always maintained.

It costs surprisingly little to equip a truck with Bendix B-K Power Braking. Write for details.

SERVICE YOUR POWER BRAKES WITH GENUINE BENDIX HOSE!

The connecting hose is a vital part of Bendix Power Braking. *Never* renew or replace this hose with anything but genuine Bendix B-K hose—manufactured especially for the purpose, to extraordinarily rigid Bendix quality standards. The cost is insignificant but the result is enormously important.

BENDIX PRODUCTS CORPORATION
401 Bendix Drive South Bend, Indiana
(Subsidiary of Bendix Aviation Corporation)

96% OF ALL POWER BRAKES ARE BENDIX

Say "I saw it in FLEET OWNER"—It Helps!

The Latest in Refrigerated Semi-Trailers

AN interesting development in highway transportation has recently been completed by the Marmon-Herrington Company, Inc., of Indianapolis, Ind., it is announced by Bert Dingley, vice-president in charge of sales.

It is a large refrigerated semi-trailer unit powered by an all-wheel-drive tractor on which is mounted a double-decked cab, the upper section being used as a sleeping compartment. This vehicle has been placed in operation, making a one-way trip each night between Chicago, Indianapolis and Louisville, Ky., hauling perishable foodstuffs.

One of the features of this equipment is that the tractor itself is of new design which permits the use of the comparatively short wheelbase of 145 inches, thus eliminating the necessity of placing the cab over the engine and, at the same time, providing the added space for the sleeping compartment. The tractor is a Marmon-Herrington Model A30S-4, driving through all four wheels and powered by a 106-horsepower engine with bus-type generator. Tires are 9.20 x 20, single front and dual rear. There are both standard and auxiliary transmissions with a total of 10 speeds forward and 4 reverse. Gear ratio is 7-2/5 to 1.

The maximum payload of the unit is 24,000 pounds. The semi-trailer, which is refrigerated with an ice capacity of 500 pounds, has both side and rear doors for loading. There are dual tires on four rear wheels, the tire size being 7.50 x 20. The overall length of the entire unit—both tractor and semi-trailer—is 33 feet, 10 inches, and the maximum width is 8 feet. The height at the highest point, not loaded, is 11 feet, 4 inches. Details of this interesting unit may be obtained on request by writing to Marmon-Herrington, Indianapolis, Ind. Mention of FLEET OWNER will be appreciated.

●

Committee to Report on Vehicle Standards

THE effects of trucks and buses upon safety and movement of traffic on the highways were considered last month by a special committee of the Chamber of Commerce of the United States meeting in Washington to report on highway vehicle standards. The need for the greatest practicable uniformity of regulation among the states was discussed with reference to highway and traffic conditions in different areas.

The Committee's study was undertaken in response to demand from the Chamber's membership for a reasonable basis for eliminating wide diversity in vehicle standards in adjacent states and sections of the country. The recommendations finally arrived at will, it is expected, be ready for consideration in connection with the convening of legislatures early in 1935.

With reference to the danger of wide vehicles on narrow highways, it was reported that the present tendency is to construct new two-lane highways twenty-four feet wide instead of sixteen to twenty feet as heretofore. It was pointed out, however, that very few highways have yet been built to the greater width. Maximum lengths of thirty-five feet for a single vehicle and forty-five feet for a combination of vehicles were considered, together with permissible wheel and axle loads and gross weights. The Committee arranged to procure additional information before its next meeting.

●

20,717 Drivers Get Silvertown Safety Awards

SINCE the program for Silvertown Safety League awards to truck, bus and taxicab drivers was inaugurated little more than a year ago by The B. F. Goodrich Company, 20,717 drivers have been presented awards for driving six months without an accident for which they were responsible, it is announced from the company's principal offices in Akron, Ohio.

In the same period, 6,518 awards for driving one year without an accident have been presented. During that period 39,958 drivers have taken part in the campaign to reduce accidents on the highways.

Each individual driver, upon completion of six months without an accident receives a Silvertown Safety League silver lapel medal and a Silvertown Safety league emblem for his vehicle. Upon operation of his vehicle for a year without accident he receives a gold medal.

Every fleet, or independent operator having a perfect no-accident record for a year is given a certificate attesting this fact.

●

Truck Body an Excellent Advertisement

THE attractive truck illustrated in the accompanying photograph was built for the Campana Sales Company of Batavia, Ill., by the Batavia Body Company of the same city. It serves to illustrate the attractive advertising effects which are possible on metal-faced plywood.

The steel faces of this material were specially prepared to take and retain the attractive finish, so that the body would serve as an excellent advertisement for as long a period as possible.

At night, the sides of the body are flood-lighted by an ingenious arrangement of lights installed just below the drip rail.

Because Plymetl was the metal-faced plywood used for the construction of this job, Haskelite Manufacturing Company of Chicago has been kind enough to furnish us with the photograph, which we know you'll find interesting. The chassis is one of the latest Whites.

5 HEAVY DUTY Motor Parts for Fleet Operators

THOMPSON "S" VALVES

Known to automotive engineers as the finest all steel valves made. Combine the maximum in heat resistance, wear and sealing efficiency. Standard equipment in leading cars, trucks and tractors, and practically all American-built aviation engines.

GRAPHITED VALVE GUIDES

Valve sticking or sluggish action caused by failure of oil from crank case to get to upper part of guide is eliminated by Thompson Graphited Valve Guides. Filled with compressed graphite compound, they provide lasting lubrication for entire bearing surface of the guide, independent of oil in crank-case.

DURACROME VALVE SEATS

Used by Chrysler, Plymouth, Dodge, Lycoming, Waukesha, Etc. Withstand highest engine temperatures. Eliminate exhaust valve "pick-up," and block seat distortion. Guarantee an absolutely gas tight seal, maximum power, and fuel economy. Postpone valve grinding 30,000 miles and more.

CHROME-PLATED PISTON PINS

Because of chromium's low coefficient of friction, extreme hardness, and resistance to pitting and corrosion in the engine, Thompson Chrome-Plated Piston Pins wear much longer than lapped finished pins. Sold in perfectly matched sets.

TIN-PLATED PISTONS

Will lower maintenance costs and greatly increase mileage for piston and cylinder walls. Can be fitted with half the regular clearances and still not bind or score. Permit immediate engine operation at practically full speed and power.

THOMPSON PRODUCTS, INCORPORATED
GENERAL OFFICES: CLEVELAND, OHIO, U. S. A.
FACTORIES: CLEVELAND AND DETROIT

Thompson Products

Say "I saw it in FLEET OWNER"—It Helps!

QUESTION *of the* MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

Some of the Interesting Replies to the Regrooving Questionnaire (No. 48):

Regrooving O. K. from Safety Standpoint

"OUR experience with regrooving has been satisfactory from the safety standpoint. While it might be more economical to run on bald-head tires, the safety angle is more important.

"Regrooving is done for us by outside shops, using the electric hot-knife type of tool. The cost is 50c for small tires; 75c for medium ones; and $1.25 for the larger types. After regrooving, we get about another 10,000 miles.

"We believe that annular grooves prevent skidding to some extent but that better results can be obtained by following the original tread design. We also find that some makes of tires are easier to regroove than others and give better results after regrooving."—*B. H. Eaton, Motor Vehicle Supt., Bell Telephone Co., of Pa., Pittsburgh, Pa., operating a fleet of* 168 *trucks and* 89 *passenger cars.*

●

Police Dept. Finds Regrooved Tires Safe

"IN our Police Department, tires on the Police cars become smooth at around 13,000 miles. Regrooving at this time gives us 5,000 to 7,000 more miles of safe driving.

"This work is done in our shop, using hand tools. Two grooves are run all around each tire, with X marks connecting them. This work can be done for about 15 cents per tire.

"We believe that the circular grooves help to prevent side-skids and the X marks further help to prevent forward slipping. We also believe that regrooving shortens the length of tire life, but it is more economical to regroove them from the safety standpoint."—*M. S. Crossley, Supt., City of Seattle Police Dept., Seattle, Wash.*

●

Does Not Believe in Regrooving

"WE would rather save the rubber in old tires than to cut it out with a regroover. We use worn tires on the rear duals, which we believe is more economical than to regroove, as we believe that regrooving shortens the tire life.

"We have had very little experience with regrooving, due to the above reasons. What was done in this direction was done by outside shops."—*K. E. Mitchell, Pres., The Greenville-Dayton Transportation Co., Greenville, Ohio, operating a fleet of* 20 *buses and* 10 *passenger cars.*

Regrooved Tires Last Longer, Says He

"WE had one pneumatic tire regrooved and ran it side by side with a baldheaded tire not regrooved. The regrooved tire is still in service, while the other has been discarded some time ago. A straight annular groove was used.

"This work was done by an outside shop and we believe that hand tools were used. The regrooving, besides lengthening the life of the tire, provided better anti-skid features. We are also regrooving all of our solid tires. Regrooving provides about one-third additional tire mileage."—*J. V. Goodbrake, Supt. Trans., Rairdon Transfer Co., Kansas City, Mo.*

●

Interesting Experience With Solid Tires

"YES, we have had experience with tire regrooving. This work is done in our own shop and we use an air-hammer and portable lathe tool for regrooving solid tires.

"Both the straight grooves and tread design are cut, the cost depending on size and design, some tires costing us $5.40 to regroove. After this operation, we get another 6,000 miles.

"We believe that any type of regrooving prevents skidding and improves traction and that regrooving does *not* shorten the life of tires. In fact running on smooth solid tires tends to loosen them from the rim, and it is more economical to regroove them."—*O. Kettle, M. E. M. S., N. Y. State Dept. of Public Works, Poughkeepsie, N. Y.*

●

More Dope on Regrooving Solids

"WE have never given any consideration to regrooving pneumatic tires and the following information will apply to *solid* tires only:

"Work of this kind is done in our own shop, using a pneumatic tool. Both straight grooves and tread designs are followed and we believe that we are getting better anti-skid qualities by doing regrooving. Besides, it makes for safer operation and creates a better feeling as to safety among our drivers.

"It is therefore economical to regroove tires, as it actually eliminates accidents."—*Ben. F. Weber, Supt., Columbia Terminals Co., St. Louis, Mo., operating a fleet of* 183 *trucks,* 116 *tractors,* 12 *passenger cars and* 474 *trailers.*

(Continued on next page)

MORE REPLIES *to the* TIRE REGROOVING QUESTION

Has Good Experience Regrooving Solids

"FOR your information, we removed two 36 x 10 solid tires from a truck that had been taken out of service. These tires were worn uneven and were sent to our machine shop to be trued up. They were then put into service on another truck and the driver complained that they were too smooth and he was unable to do anything with the truck—no traction and plenty of slipping and skidding.

"These tires were again removed and three ¾" wide grooves, of the same depth, were cut into each tire, annularly. The tires were put back into service and since regrooving they have been run approximately 6,000 miles, the driver being very much satisfied with their performance. They were later on regrooved again and put back in service and are still running.

"We believe that regrooving not only increases the life of the solid tires, but also acts as a cushion, prevents side-skid and gives better traction.

"The labor cost for regrooving was about $1.00 per tire. We believe that straight circular grooves are the best and shall continue to regroove solid tires in our service."—*J. H. Haggerty, Garage Foreman, Lehigh Navigation Coal Co., Lansford, Pa.*

●

Retreads O. K. If Handled Sensibly

"RETREADING of tires, if handled in a sensible manner, is an economical procedure under present tire costs, in our opinion. We refer to the process where the old tread is entirely removed, the carcass thoroughly inspected and a new tread put on if found o. k.

"This work is done for us by a local dealer and they are guaranteed the same as a new tire. It costs about 50% of the price of a new tire and so far, we have gotten as high as 90% of the original mileage out of retreads.

"Our retreads seem to stand up well, as our service is not extremely hard. The amount of service obtainable from a retreaded tire depends on the condition of the carcass. If they are properly selected, retreading will pay.

"Our experience covers a little over a year on our fleet; however we have used retreads for several years on bus tires that were rented on a mileage basis."—*N. W. Glass, Supt. Auto Equipment Indiana Service Company, Ft. Wayne, Ind.*

●

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 50—Valve and Valve Seat Grinding

How often do you grind the valves of your engines? (Please indicate below):

Pass. Cars ..... Light Trucks ..... Heavy Trucks ..... Buses .....

What method is used for grinding valves? (Please check below):

☐ Grinding with compound; ☐ Electric valve refacer; Others .....

What method do you use for grinding valve seats? (Please check below):

☐ Valve seat reamer; ☐ Valve seating stone; Others.....

How do you recondition the new type, hard-faced valve seats? .....

If an electrically-driven stone is used, does it work eccentrically or concentrically? .....

If valve-reconditioning machinery is used, do you also finish-grind with compound? .....

Which compound is best, water-mixed or oil-mixed? .....

Have you had occasion to install new valve-seat rings on old equipment? .....

What has your experience been with same; satisfactory or not? .....

Does any of your new equipment have hard-faced valve inserts? .....

Do you find that less valve grinding is necessary because of same? .....

Have any of these come loose? ..... If so, on what vehicles? .....

What is the mileage interval between valve grinds on such jobs? .....

Please state your source of supply on valves for replacement. (Kindly check)

☐ Vehicle Dealer; ☐ Vehicle Mfr.; ☐ Jobber; Others.....

If you want literature on the latest developments in valve seating equipment, please check here ☐

Other remarks on the subject, if you please.....

.....

.....

We operate .....Trucks; .....Buses; .....Pass. cars; .....Trailers

***Note:** If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.*

Swap your Maintenance experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm .....

Address .....

City and State .....

Your name ..... *Position*.....

LOOK HERE!

(for Your Trade Literature)

•

ALL material listed on this page has been personally selected and is recommended by your Editor. Executives of automotive fleets may obtain any or all of them by marking the numbers on the coupon below. You have our assurance that this will not obligate you in any way.—H. C. F.

191. **Free Slide Rule.** Here is a device that unravels all of the mysteries about hot and cold plugs. If you have an engine that's fouling plugs and needs hotter ones, just work the slide on the Champion Spark Plug Slide Rule and presto, you learn the next hotter plug to use. It works the other way too should you need a colder running plug. It's easier to work than the zipper on your tobacco pouch and M. C. DeWitt of Champion tells us that they have plenty of these on hand for free distribution to fleet operators. One will be sent to you immediately; just indicate your desire by marking No. 191 on the coupon below. A very interesting and valuable device.

•

192. **Trouble Shooting Made Easy.** Here's a 44-page book that ought to make an automotive expert out of even your dumbest mechanic. Although designed primarily for the private car owner, it's such a complete and thorough job—in many cases far from elementary—that it's bound to interest fleet executives and their subordinates. The book is divided into easy-to-find chapters each with a staggered heading, so that any difficulty can be looked up in an instant. It should be particularly valuable for drivers who are not thoroughly familiar with the mechanical features of their vehicles. After you have seen one copy perhaps duplicate copies may be wanted. Number 192 on our coupon below will bring you a free copy. It's profusely illustrated with over 120 drawings.

193. **Underslung Power and Pancake Engines.** These might sound like new expressions to you. They are. A progressive truck manufacturer is making them the basis of his latest offerings. Two books are offered on these subjects. Not the usual catalogs—not the usual engineering articles—but attractively illustrated brochures that *explain* rather than attempt to sell; they *entertain* rather than bore. If you want to keep abreast of the latest truck developments, we know you'll send for these two books. Number 193 on the coupon below brings them.

•

194. **Spark Handicap.** There's a new one for the advertising man. There's a new motor disease that we must reckon with. Many engines do not deliver the best that is in them or give the best economy because the ignition system is built too near the "ragged edge" to meet engine requirements. Read *"Facts About Ignition"* by M. Mallory, whose articles you have seen in this publication from time to time. If you want to become an ignition "expert" this book will at least put you one step nearer your goal. And Number 194 on our coupon brings you a copy; free, gratis and for nothing.

•

195. **Heavy Loads on 1½-Tonners?** Although the truck engineer will not exactly advocate your carrying many tons on his 1½-tonner, it's being done in the best of families. Of course there are right and wrong ways of doing it. The use of 6-wheel units is one of the right ways. And the use of semi-trailers is another. Special folders have recently been issued that illustrate and describe new six-wheel units for Ford and Chevrolet trucks. They point out many interesting possibilities. This type of unit is claimed to be the simplest and most flexible. Dare them to prove it by asking for No. 195 on the coupon below.

•

196. **Synthetic Enamels.** Now that you've read our articles on Synthetic Enamels which appeared recently (we hope you've read them), it might be considered good form if you investigated or at least read some literature on the subject. We've included such literature in this department from time to time. The latest literature called to our attention consists of three elaborate folders—one on synthetics, one on lacquers, and one on all other types of finishes made by one manufacturer. Each folder is replete with color chips to help solve your matching problems. Number 196 brings copies of this literature; free for the asking.

•

197. **Aluminum Body Facts.** Every day we hear more and more about the increasing use of aluminum for truck bodies of all types. With state regulations becoming more strict, it's not surprising that operators all over the country are turning to this weight-saving alloy. So that you may be in a better position to weigh all of the possibilities, a very elaborate book has been prepared entitled *"Aluminum for Truck Bodies."* In addition to the advertising material, which you'll find in almost all literature, there's lots of valuable information on the actual building of all types of bodies, from tanks to refrigerators. Plans are also included for many types of vocational bodies. Number 197 brings a free copy of this book to fleet operators.

•

198. **Heavy Hardware Catalog.** We are not the type of individual who tries to disguise a catalog with a fancy name such as "reference book," etc. This is truly a catalog, covering such items as heavy-duty socket wrenches, water-pump and shaft packings; soft-faced hammers; rawhide mallets; automatic lubricators; belt fasteners; polishing leathers, etc. There's also some useful information contained in it, especially valuable to the plant engineer. Number 198 brings a free copy.

•

199. **How to Keep Costs.** An interesting truck-cost system was described and illustrated on page 22 of our September issue. Over 8,000 requests were received for sample sets of these forms. The system was designed especially for the smaller fleet operator. If you have not as yet received your sample set of these forms, which you can put right to work for you, just include Number 199 on the coupon, and we'll see that a set is sent to you right away, with the compliments of the copyright owners.

•

200. **How to Tune-Up the V-8.** If you are using Ford V-8's in your fleet, and many operators are, you should have a copy of this tune-up book entitled *"Making Good Performance Better."* It is a 40-page book that illustrates and describes the whole procedure necessary to put any V-8 engine in maximum operating efficiency. The ignition, vacuum timing, fuel-pump and carburetion systems need no longer be a mystery to you. Since the Ford Motor Company offers this book, there can be no question as to the authenticity of the information contained in it. We'll see that you get a free copy if you indicate your desires with Number 200 on the coupon.

The Editor, FLEET OWNER, ... 1934
90 West St., New York, N. Y.

Kindly send me without cost or obligation the following literature mentioned in the October issue. (Order by number)

....

....

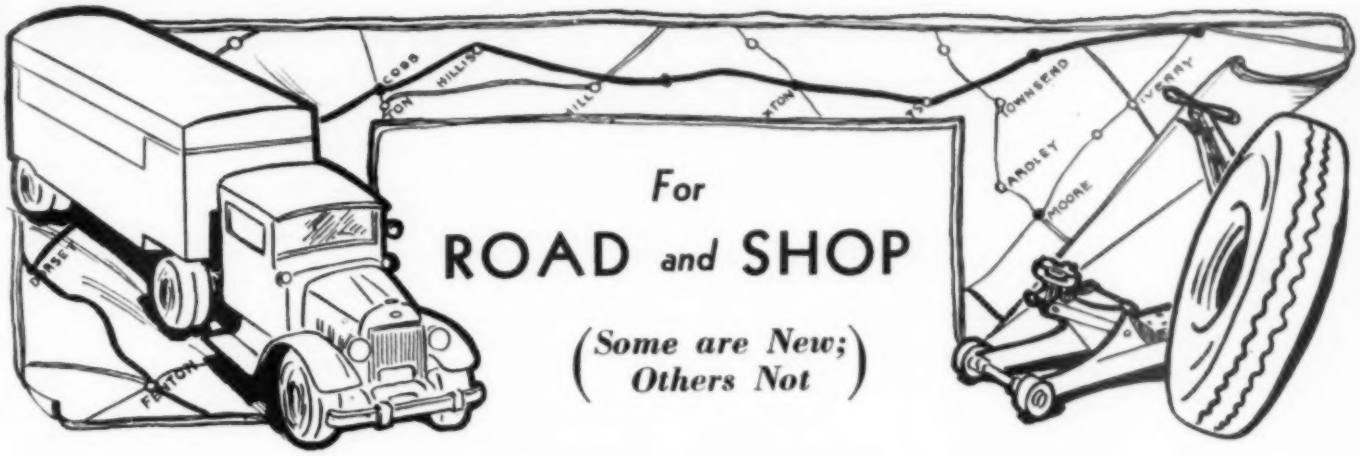
Name of Fleet .....

Address .....

City and State .....

Your Name ..... Position .....

Number of Vehicles Operated .....



New Electrical Connectors for Tractor-Trailer Use

SPECIAL electrical connectors for use between trucks and trailers for providing power for lights and electrically-operated brakes, have been recently announced by The Pyle-National Company, 1334 North Kostner Ave., Chicago, Ill.

These connectors, consisting of special types of plugs and receptacles, provide dependable service, eliminate road delays, reduce fire hazard, and end the troubles and costly maintenance experienced with lighter types of equipment, the makers claim.

Both plugs and receptacles are of substantial weather-proof construction, with bakelite insulation, renewable contacts, and heavy steel shells to withstand severe service. A positive locking device is provided to prevent disconnection due to road shocks. Receptacles have spring covers to protect receptacle contacts when the plug is not inserted.

A receptacle is mounted on the truck cab, and a similar receptacle on the front of the trailer. Heavy duty flexible cord equipped with connector plugs is used to make the connection between truck and trailer. Plugs are so constructed that an accidental ground cannot be made, even if the plugs should touch the truck frame or other parts. They are so arranged that they can be inserted only one way, to guard against changing polarity.

Plugs and receptacles carry an Underwriter's rating of 20 amperes, insuring ample carrying capacity. Details of the installation, with wiring diagram and recommended bill of material will be furnished on request. You'll mention FLEET OWNER when writing, won't you?

●

Simmons Brake Cable Line

A COMPLETE line of brake cables for all popular cars has been announced by The Simmons Manufacturing Company of Cleveland, Ohio.

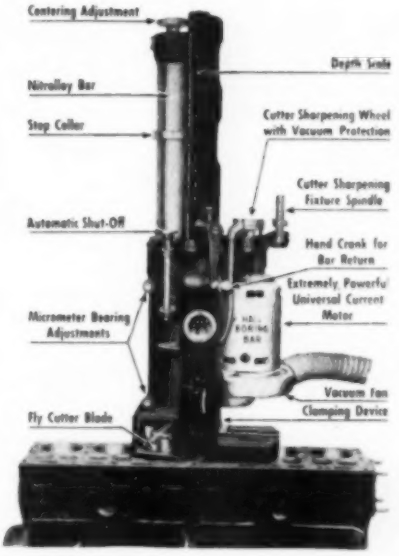
The new Simmons brake cables include end fittings of high grade steel, felt washers on both ends to prevent leakage of lubricant, a special fabric covering the flexible metal armor to protect the cable in severe wet weather, cadmium plating to prevent rust and a grease fitting which permits greasing by the same gun used in lubricating other parts of the car.

By using cleats, each Simmons cable may be adapted to many cars and a minimum of 23 numbers will accommodate all service requirements.

●

Hall Boring Bar Has Vacuum System

THE outstanding feature of the new Hall Boring Bar, illustrated here, is the vacuum system which serves a dual purpose—keeping cuttings and dust out of the motor, and keeping the cutter head cool.



The vacuum system is built-in and is operated by the same universal motor that drives the bar itself. This feature not only saves time in cleaning up after boring, but it also makes it unnecessary to immerse the cutter head in hot water before boring, in an attempt to compensate for the expansion caused by the heating of cutter during operation. Thus, it is claimed, time is saved, damage by cuttings avoided, and a uniform bore from top to bottom assured, since the vacuum fan keeps the cutter head at a uniform temperature.

The bar itself is of typical Hall construction, made of Nitralloy steel. It is 2-3/16" in diameter, revolves at 300 r.p.m. and has a range of from 2⅝" to 4-9/16". It was recently described in this publication, without the vacuum attachment which is *new* and will be seen for the first time at the Joint Trade Show in Cleveland this month. For interesting catalog sheet address Hall Manufacturing Co., 1620 Woodland Ave., Toledo, Ohio. Mention of FLEET OWNER will be appreciated.

●

New Heavy-Duty Air Cleaner

AN oil bath type air cleaner, known as the AC Triplex Heavy Duty air cleaner, has been introduced by AC Spark Plug Company, Flint, Mich. It is recommended for use on engines in extremely dusty territories.

It is quickly interchangeable with the silencer and air cleaner installed on many carburetors as standard equipment and will not affect the power and economy in any way. It is designed especially for direct attachment to downdraft carburetors on passenger car engines or trucks equipped with the same engines as used in passenger cars of the same make. In truck service, particularly on construction work, and for passenger cars and trucks used in alkali or extremely dusty territory, this type of cleaner is necessary for prolonging engine life and saving repair expense.

Cleaning operation is simple. Remove the top cover and lift out the filter element assembly. Wash this in gasoline and allow it to drain thoroughly. Empty the excess oil out of the base and scrape out the accumulated mud. Then wash the entire oil base in gasoline and fill to the indicated level with 1 pint of S. A. E. 50 engine oil.

The periods of cleaning vary greatly according to the particular conditions under which the car or truck is operating. Experience only will tell

what this period may be. For very extreme conditions, such as road construction work, etc., once a day is sometimes necessary.

NEW STUFF *for* ROAD *and* SHOP (*Continued*)

Cooling Fan for Tires

A NEW type of cooling fan for tires, invented by Rogers Bros. Corp., trailer manufacturers of Albion, Pa., was recently put through exhaustive tests by the B. F. Goodrich Rubber Company of Akron, Ohio.

With the fan mounted in a properly ventilated dual wheel assembly, as shown in the picture, it was believed that sufficient air could be circulated through the wheels to appreciably lower brake drum and rim temperatures and hence prolong both tire and brake life.

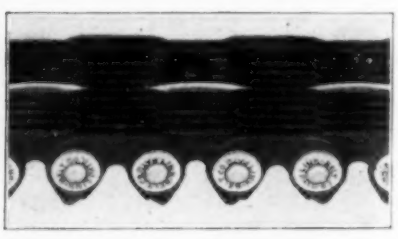
Four tests were conducted on special test equipment and the conclusions drawn were that this cooling effect lowered rim temperatures 50% more than plain duals under like conditions. In other words, 50% more frequent or severe brake applications are made possible without raising rim temperatures above normal, it is claimed.

For a detailed report of this test, including graphs and other illustrative matter, address Rogers Bros. Corporation at Albion, Pa. Mention of FLEET OWNER will help.

●

New Chain Announced by Link-Belt

IN keeping with today's trend toward greater thought to the aesthetic in designing even the commonest machinery part, Link-Belt Company, Indianapolis, announces that it has given a "new dress" to a 32-year old product, the Link-Belt Silent Chain



Drive, by bluing most of the chain, and treating the washers and guide bars to give them a silvered appearance. The bluing of the bulk of the chain has the effect of placing the silvery parts on a dark blue background, thereby emphasizing the silvery parts.

The trade name "Silverstreak" has been adopted as a fitting designation, since when the drive is in operation, the motion of the chain describes a silvery streak. Thus, the modernized chain has a distinctive appearance irrespective of whether it is in motion or lying in stock awaiting installation. It is made in all standard types, for both industrial and automotive silent timing.

No claims for improved efficiency, strength or durability are made, as it is said that silent chain is inherently positive in action.

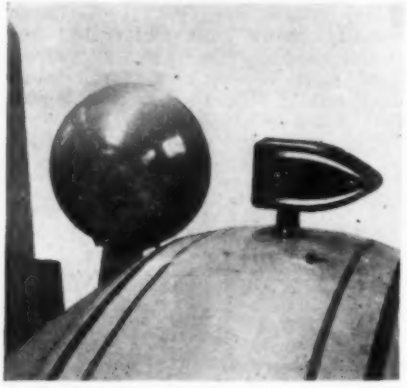
●

"Turn-Signal" Direction Indicator

TURN-SIGNAL, illustrated here, is produced in both passenger car and commercial vehicle models. It is operated manually, by a double-throw switch which can be mounted on the steering column or instrument panel.

Mounted in the switch is a sound device which buzzes when the signal is on, reminding the operator to turn it off when the turn has been completed. The directing lights flash, drawing attention to the signal and increasing its visibility. The sound is also intermittent.

Heavy-duty sets are made up of individual signal lamps, so that they can be mounted on front fenders or the side of the cab; and on the rear corners of trucks and buses of the



wider type. The passenger car type is made up in one unit, for mounting on front bumper, headlamp tie-rod, rear bumper, etc.

Turn-Signal lamps of the single front type, as mounted on fenders or cabs, show illumination both in front and back of the lamp, so that a car travelling alongside can be made aware that a turn is contemplated. The illumination consists of an arrow-head as shown.

Lenses are made up and mounted so as to reduce the tendency towards breakage. Every part is well designed and balanced to insure long life and freedom from vibration, the makers state. Write to Turn-Signal Corp., 400 E. Rittenhouse St., Philadelphia, Pa., for further information.

●

Improved Valve for Oxweld Blowpipe

A NEW type of needle valve—the ball-seat needle valve—is now being supplied on most Oxweld blowpipes, according to a recent announcement of The Linde Air Products Company, 30 East 42nd Street, New York, N. Y. The new valve design is a great improvement over the old, and is interchangeable on all of these blowpipes now in service.

The new type valve consists of a seat between the blowpipe body and the needle valve, which is made of a hardened and highly polished stainless steel ball, held in a cage at the end of the valve stem. Tests have shown this type of seat to have sealing properties that are strikingly superior to other designs.

This type valve closes readily with but the slightest effort of two fingers and opens with equal readiness. The polished ball frees itself readily of all foreign particles that might impair the gas-tight seat. Consequently, blowpipes using these valves will need less maintenance work than ever before.

●

Kleenway Auto Drainer

A NEW product of special interest to the fleet owner field is announced by the Liberty Foundries Company. It is known as the "Kleenway Auto Drainer."

The drain pan is mounted on four casters. There are two parts to it, the tank and the pump. The drain tank will catch any or all of the liquid as it is drained from the radiator. There are many times, especially in the winter, when a portion of the contents of the radiator must be drained out to add more anti-freeze. The pump returns practically every drop of the liquid to the radiator. The drainer is equally practical for draining oil from the crankcase.

It will go under any car and may be pushed into position from front or side. In draining the cooling system, the water will not run all over the floor or driveway, as the Kleenway is so constructed that all drainings will enter the tank regardless of where the flow may be, the makers state.

The drainer is almost indispensable when installing a hot water heater, a new radiator hose or performing any operation on the cooling system. When the tank is full, it can be set up on end, out of the way until the solution is ready to be put back into the radiator.

The pump is easily detached and when more than one tank is required, one pump can be used to serve several tanks. Both the tank and pump should last a lifetime. For list price and catalog sheet address Liberty Foundries Co., Rockford, Ill. You'll mention FLEET OWNER, won't you?

KEEPING TAB on the new SPEEDWAGONS

"SO much truck for so little money," is the way Reo Motor Car Company executives describe their two new Reo Speed Wagon offerings, just announced. One is an entirely new ½-ton commercial unit which brings passenger car performance and speed to the job of transporting light loads. The other is a further refined and improved 1½-ton unit as a successor to the well known 1½-ton Speed Wagon.

The first feature of both that strikes the eye is the graceful streamlining of the exteriors. Inside the cabs one finds comfort and roominess comparing favorably with passenger cars. Behind the new beauty, it is said, Reo engineers have built strength, sturdiness, dependability and long life.

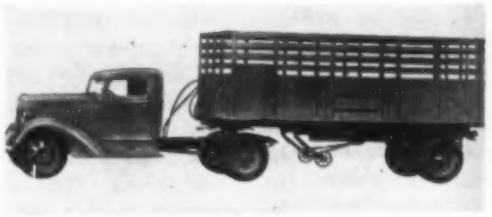
Despite the fact that the aim of the builders in developing these new models was to provide the lowest possible total operating cost over long periods of service, the prices are low. The base price of the ½-ton commercial panel, f.o.b. factory, is $695 and that of the 1½-ton Speed Wagon chassis is $595.

Looking behind the new fenders, new hood, new shields, new lines and other external features which contribute to the low appearance of these Speed Wagons, the mechanically-minded operator who studies specifications and mechanical anatomy will find the many well known Reo characteristics, along with further refinements and improvements.

The Flying Cloud engine of the ½-tonner and the heavy-duty Gold Crown engine of the 1½-ton Speed Wagon, both Reo built, are similar in external appearance. Both have the same bore and stroke, 3⅛ x 5 inches, giving a displacement of 230 cu. in. The engine of the lighter job is rated at 80 H.P. at 3200 R.P.M.; that of the 1½-ton, 68 H.P. at a speed of 2800.

In the interest of freedom from wear and from need of adjustment over long periods of service, both engines conform to established Reo practice in having 4-ring, camground, Lo-Ex aluminum alloy pistons operating in chrome-nickel alloy iron cylinder blocks; inserted alloy steel exhaust valve seats; 7 bearing, 2⅝ inch, counterbalanced crankshafts with shimless, interchangeable close-limit type babbitt-lined main bearings; shimless, centrifugally-cast connecting-rod bearings; diamond-bored, selectively-fitted piston pin bearings, with pins 61/64 inches in diameter, floating in rods and piston bosses; and full force feed lubrication.

Insulation against transmitting road vibration through the power plant to the frame and against fluctuations in engine torque is provided by flexible, air-cushioned live rubber engine mounts.



This Reo-built tractor and semi-trailer unit has a gross load capacity rating of 17,000 lbs. Among the mechanical features of the tractor are: Gold Crown, 6-cylinder, 7-bearing engine, with chrome-nickel-alloy block, lo-ex aluminum alloy pistons and inserted alloy valve seats. A 10-inch, dry-plate clutch, helical-geared transmission, full-floating rear axle, cam-and-lever steering gear, internal hydraulic brakes, and vacuum-operated hydraulic trailer brakes are additional features pointed out by the maker.

The free-flowing lines of the fenders, shields, radiator grille, hood and cab of this Reo-built stake body on the new 1½-ton Speed Wagon chassis, reflect modern development of aerodynamic streamlining. The mechanical features listed above, also prevail in this model, the makers state. The 1½-ton chassis for all of these models lists at $595 f. o. b. Lansing, Mich.

Reo's new 1½-tonner, with dump-truck body, is shown here. This model also incorporates the latest in aerodynamic streamlining, and, which is probably more important, the many characteristic Reo features enumerated in the two captions appearing directly above. The cabs in all of these models are claimed to afford passenger-car comfort to the driver. An attractive folder describing the new 1935 Reo Trucks has just been issued. For your free copy, address Reo Motor Car Company, Lansing, Mich.

The transmission of the ½-ton commercial unit is of the helical gear silent type, with synchronizing mechanism for intermediate and top speeds. The 1½-ton Speed Wagon gearset is Reo-built and entirely new. Helical countershaft drive gears insure quiet operation in all four forward speeds and tapered roller countershaft bearings reduce friction and provide for the thrust set up by the helical gears.

Following Reo practice, the gears in both transmissions, like Reo axle shafts, drive pinions, ring gears, steering knuckles and arms, and many other vital parts subjected to severe shocks and stresses in service, are made of nickel molybdenum steels, heat-treated to develop the physical properties required of the individual parts to resist impact, pressure and wear.

The re-designed 1½-ton rear axle has been made stronger, more rigid and yet lighter. The frame has been made heavier and stronger, as have, also, the springs, the makers state.

For safety and ease of operation, both of these new Reos are fitted with cam-and-lever steering gears and with fully enclosed, self-replenishing, self-equalizing hydraulic brakes, operating in centrifuse drums, providing 170 square inches of service braking area in the ½-ton unit and 246 in the 1½. The transmission or parking brakes on both models are 2 inches wide, operating on a 6 inch drum on the smaller unit and on an 8 inch on the larger of the two Speed Wagons. Both models are fitted with tilting beam headlamps.

Mack to Handle Reo Sales

ANNOUNCEMENT was made last month that arrangements had been completed with the Mack-International Motor Truck Corporation, to sell and service Reo Speedwagons in several cities, according to C. A. Triphagen, sales manager of the Reo Motor Car Company.

The cities include: Brooklyn, N. Y., Oklahoma City, Louisville, Tulsa, Omaha, Memphis, Akron, Erie, Baltimore, Chattanooga, New Orleans and Seattle.

Complete displays of Reo's new 1935 Speedwagons will soon be announced in these cities. Complete parts and service facilities will be maintained by the Mack Corporation.

An official of the Mack Corporation stated: "For a long time we have been deliberately making a study of the light-duty field in order that we could recommend such equipment to our many Mack owners who have need for lighter capacity trucks than Mack builds." It would seem that the Reo arrangement is the answer to this problem.

How to Make a Cost-Analysis

(*Continued from page* 18)

distinct co-relation between elapsed mileage and cost per mile for vehicles of similar capacity. This is just as it should be, for fixed charges, when divided by high mileage figures, give a lower cost per mile than if they were divided by low mileage figures.

Tables covering the Cost per Mile for Running Expenses, and the Cost per Mile for Labor are shown in Figures 4 and 5. You will note that a co-relation also exists between mileage and cost per mile. This is due to the fact that the garage payroll is divided equally among all machines, and the labor charge, when divided by a low mileage figure, must necessarily give a higher cost per mile figure than if it were divided by a high mileage figure.

These tables are presented to show the incongruity of the present method of labor allocation. Tables of this sort should indicate the vehicles in the fleet that are expensive to operate. However, an analysis of the table on Cost per Mile for Labor (Figure 5) shows, for example, that Vehicle Number 24, which has only travelled 27,000 miles, costs 3.4 times more per mile for labor than Vehicle Number 3, the total mileage of which is about 200,000 miles.

All items of expense for individual cars, such as is shown in Figure 1, were totalled to determine the operating costs of the fleet as a whole. The costs of operating the entire fleet are shown in the table, Figure 6. These figures do not represent the total operating costs of the entire fleet for all years indicated, for it includes only the machines still in operation at the end of 1933. However, the costs for 1933 are nearly complete, for the only machines not included are a 1½-ton Reo, destroyed by fire in May, 1933, and not replaced; an old tow car, traded for a new truck in June, 1933; and a Ford sedan, operated for two months in 1933.

The cost of each item in relation to total cost is represented in the form of a percentage in the table showing the costs of operating the entire fleet (Figure 6). An analysis of this table shows that the cost of gasoline is the largest single expenditure, and that the other expenses, in the order of their magnitude, are as follows: Labor, Depreciation, Insurance, Rent, Repair Parts, Tires, Interest on Investment, Oil, Overhead and Taxes.

Recommendations: Any attempt to reduce expenses should at first be confined to the items of greatest cost, it is the author's contention. Let us discuss them in their proper order.

Gasoline: There are several possible "leaks" attendant to this item. Among them might be mentioned the following: misappropriation by means of various schemes; faulty mechanical adjustment; and poor driving habits. The use of the wrong types of vehicles on certain routes may also result in a gasoline loss. Misappropriation is controllable to a large extent. The author favors a daily report from the garage showing the amounts of fuel received and dispensed. More will be said about this in a later issue, when the subject of accounting procedure is taken up. The present monthly report used in this fleet allows too much time for the "juggling" of figures. The weekly drivers' reports, (illustrated on page 16 of last month's issue) would also serve as a check, especially if the drivers and garagemen knew that the miles per gallon of gas were being calculated. This latter report would indicate ex-

WILSON & COMPANY FLEET

Mr. W. P. Clark
The Sherwin-Williams Co.
Kansas City, Missouri

Dear Sir:

Our experience with Sherwin-Williams Kem Transport Enamels as used on our truck equipment here at Kansas City has proved very satisfactory.

We like Kem because of its workability, durability, and fine appearance.

(Signed)
W. J. McMahon, Supt.
Wilson & Co., Kansas City

"We like KEM because of its WORKABILITY, DURABILITY and FINE APPEARANCE"

Sherwin-Williams Kem Transport Enamels *cut the cost of fleet maintenance* and increase the advertising value of vehicles.

That, in brief, is why they have won enthusiastic approval from every type of industry which operates truck fleets, large or small. S-W Kem Transport Enamels *lower* the *material cost* of truck finishing because of *greater covering* capacity. They *lower labor cost* with greater *ease* and *speed* of applica-

SHERWIN-WILLIAMS

Say "I saw it in FLEET OWNER"—It Helps!

cessive gasoline consumption and all possible corrective measures should be taken.

The use of a device such as the exhaust gas analyzer, or a flow-meter, would indicate any mechanical faults. For example, General Motors Truck Company reports, in a pamphlet entitled "Why Preventive Maintenance" that the use of a flow-meter showed that by doing nothing more than cleaning and adjusting spark plugs, a 10% increase in fuel economy was obtained. This was substantiated by a field test.

Other well-known causes of excessive fuel consumption are: excessive use of the choke; failure to keep radiator covered in cold weather; excessive racing of engines; too rapid and too frequent acceleration and deceleration; excessive use of low gears which might be avoided by skillful driving; idling engines too much at stops.

The Combined Publishing Company did not, up to the present, use anti-freeze solutions in their trucks during the winter months, allowing the motors to idle during cold weather. An accurate check on gasoline consumption should indicate whether or not this practice is economical. (We believe you will find that it is *not.*—ED.).

A table giving the miles per gallon of gasoline for each vehicle by months was also prepared, which shows varying m.p.g. figures from as low as 5.3 m.p.g. on some trucks, to as high as 17.5 for the coupes and sedans. These figures are very erratic for some machines, since the trucks are used on definite routes and there should be a fairly constant use of gasoline with a normal increase during the winter, due to tougher going and the increased idling of motors. Where certain vehicles made a poor showing in fuel consumption, it would seem as if this were more apt to be due to faulty mechanical adjustment, than to poor driving, since these trucks are driven by the same men all year around and as they are men of long experience, it does not seem probable that their driving ability would vary from month to month.

Although we are not showing the gasoline consumption for each vehicle, it might be well to explain how it was arrived at. The amount of gasoline in vehicle tanks was not noted at the time of recording speedometer readings. This should not affect the computed figures by more than ½ mile per gallon at the most, however. Over a long enough period, the amount of gasoline in the tanks would have a negligible effect on any calculations.

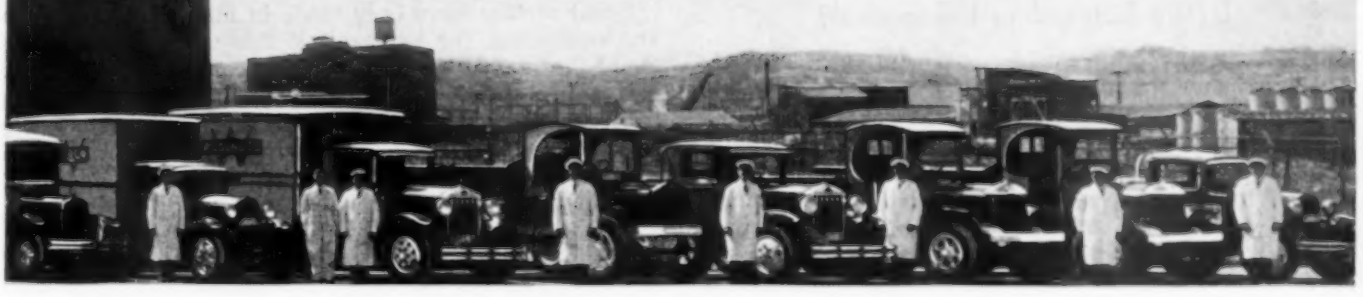
The fact that some trucks showed fairly good fuel consumption records for some months and poor records for other months, shows that it is possible to have constantly good records, and that there is an opportunity, somewhere along the line, for a definite improvement in gasoline consumption in this fleet.

The gasoline records of the coupes and sedans studied in this operation are particularly poor. Three of these cars are used for country work, where traffic is light, runs are long and stops are few. They should operate very economically, but they have not. A newspaper in Grand Rapids, Mich., for example, reports 17.3 m.p.g. for a 1½-ton truck on a country run, and 14½ m.p.g. for another 1½-ton truck in city service. A local utilities company reports an average of 15 m.p.g. for sedans used in city service.

An improvement of 10% in fuel efficiency of trucks, and a 25% increase in fuel efficiency for coupes and

(*Please turn to page* 56)

FINISHED WITH S-W *KEM* TRANSPORT ENAMELS



tion. They further reduce *both* labor and material cost because trucks finished with Kem do not have to be refinished so often, due to greater durability of Kem, longer life and better gloss retention. The less time a truck spends *in the shop* for painting, the *more* time it stays *in revenue-producing service.*

FREE--**Individual Finishing Specification Service**

Will be made to fit your needs after a careful study of your finishing problems. Will reduce to a minimum the number of days your trucks need to be in the shop for refinishing. *Every day less cuts finishing costs in half!*
No cost. No obligation. Write The Sherwin-Williams Co., Dept. 623, Cleveland, Ohio.

SHERWIN-WILLIAMS QUICK KEM Automotive FINISHES

NRA

SWP COVER THE EARTH

KEM TRANSPORT ENAMELS

Say "I saw it in FLEET OWNER"—It Helps!

Putting the Chassis Inside the Tank

(*Continued from page* 34)

between the tractor and trailer. Long use of the well known Curtiss Aerocars and practical tests have shown that it almost completely eliminates destructive vibration and shock in starting, stopping and running, and actually permits quicker stops, it is claimed.

The braking system on the trailer is electrical and is operated by the cab brake pedal. The system uses a maximum of ten amperes of current and is operated from the tractor battery. The brakes on the tractor are hydraulic.

The lighting system also is operated from the tractor unit battery. Aside from the headlights there are red and green clearance lights on the forward ends of the skirting around the tank, side lights over the wheel housings, two stop lights and the fixed red rear lights.

The Aerotank runs on four 7½ by 20 heavy duty tires. The tractor has four 6½ by 20 truck tires in the rear and two 6½ by 20 truck tires on the front. The weight is distributed as follows: the front axle bears 2,490 lb., the rear tractor axle bears 3,900 lb., and the trailer axle bears 8,600 lb. when the tank is filled to capacity with gasoline. This is a total gross load of 14,990 lb. When empty, the trailer weighs 3,960 lb. and the Reo 4,580 lb. Due solely to the light weight of the trailer, the Aerotank unit permits hauling the maximum payload without exceeding axle load limits.

As for the practical, as opposed to the legal aspects of light weight, the use of aluminum resulted in a trailer which weighs 1,120 lb. less than its predecessor of the same type. This means either quicker acceleration and braking in case tractors of the same power are used, or a saving in initial cost of the tractor if a less powerful unit is used.

The most striking detail of the appearance of this truck is the way it hugs the ground. It is 83½ in. wide but only 69¾ in high. The low center of gravity is the direct result of eliminating the chassis. A low, light truck such as this one is least likely to raise objections to "Road Hogs" for it is built to keep up with passenger traffic.

●

Is Tire Retreading Economical?

(*Continued from page* 36)

worn-out after its tread is worn off, and should not be retreaded, even though the carcass "looks" good.

However, by using an *oversize* tire in the beginning he believes that even though the tread be worn off, the carcass will not have suffered much, and that under certain conditions a retread job will give good service.

Acting on this theory, for instance, they use double or triple oversizes on their ¾-ton jobs; such sizes as 8.25 x 20 balloons. When the treads of these tires wear off, they have them retreaded, in some cases, and the cost is about 60% of the original cost of the tire.

This retreading work is farmed out to firms specializing in it, who guarantee as much mileage as the tire originally delivered. But they seldom get 100% of the original mileage; somewhere between 60% and 75% is more like it, on the average.

It goes without saying, therefore, that if they get *less* than 60% of the original mileage, the retreading procedure will be a *losing* proposition, since it costs about 60% of the cost of a new tire.

This operator does not seem to be having difficulties with tread separation on retreads; any difficulties are found in the carcass. The machines and methods of retreading have been developed to a high state of perfection, he believes.

It would be well to bear in mind that this particular operator *knows* the exact history of each tire, before he decides to retread it. A tire used on a truck that has been operated over hilly, rough and stony roads is not expected to have a good carcass left, after the tread is worn off; therefore they will not retread this tire. On the other hand, a tire that has been run on smooth concrete, for the most part, will stand good chances of performing well when retreaded.

From the foregoing we can see that much of the success of the retread job depends on the use to which the tire was put *before* retreading, just as much as it depends on the type of service to which it is put after it goes back into service.

Where the fleet operator falls down on the job of *selecting* a tire to be retreaded, he will be most likely confronted with blow-outs, road delays and an exceedingly higher cost-per-mile, than if new rubber were used. Naturally, he will blame the retreading job as the cause of his trouble.

Similarly, most of the replies received to our questionnaire seemed to stress this fact. Some few operators reported that they would fight shy of retreading at *any* price, provided that the tire has delivered at least 75 per cent of its expected mileage.

And that, folks, is what we learned from our questionnaire on tire retreading. It is particularly gratifying to note that practically all of the operators replying showed considerable interest in learning what the other fellow is doing. By this writing, those participating will no doubt have received their typewritten tabulations of all the returns. Those of you who have not, will have to be satisfied with the handful of letters which we have reproduced in our last month's issue. For, no tickee—no shirtee.

As in all things, history repeats itself. When tires were being sold at record-breaking low prices, few people bothered about retreading. Now that tires are going up in price again, retreading is being thought about by many people. It is just the repetition of another cycle, similar to what we have had in the past. Whether or not it pays to retread, you alone will have to decide.

Great strides have been made in materials, machines and equipment for performing this work. We understand that some of the larger tire companies are doing retreading—both as a service to operators as well as to tires which they own and rent out on a mileage basis. It would seem that a tire manufacturer, or factory branch, would be best fitted to perform a retreading job; however, don't let us influence you either way.

●

Jewel Tea Drivers Get Safety Awards

TWENTY-EIGHT route managers of the Jewel Tea Co., Inc., who have operated their automobiles for five years without being involved in an accident, have just been awarded Gold Star Memberships in the Jewel Star of Safety League.

At the same time, 330 route managers who have operated their cars for twelve consecutive months without being involved in an accident were awarded Silver Star Memberships. Of the total men eligible for awards, 65% won either the gold or silver membership.

These men have operated over 5,000,000 miles without being involved in even a minor accident in territories heavily traveled by automobiles and pedestrians.

Blind Data

Advertising buyers never see what they buy—they're just TOLD about it.

What they want is a certain number of readers of a certain specified character. A publisher SAYS he has them. That's all.

That's all unless—unless a publisher provides a recognized independent audit report on his circulation such as furnished by ABC for "paid" media and CCA for "controlled" media.

Honesty pervades most business. However, in a business where the article sold cannot be actually shown but can only be pictured, isn't the buyer entitled at least to an unbiased and scientific description? "Entitled"? He should DEMAND it.

The New Schrader DUBLTITE

Rubber-Covered-Base Metal Valve

combines the strength and security of the ALL-METAL stem with positive air seal at base through integral construction with tube

Today's higher driving speeds and severe tire stresses demand more than ever the strength that the all-metal valve stem assures. Hence, in cooperation with the tire industry, Schrader has perfected an *all-metal valve stem solidly cured onto a thick, strong base of highest quality rubber.* With this base, in turn, solidly vulcanized onto the tube wall, rubber tube and full-length metal stem are "welded" into a complete unit. All the time-proved advantages of the all-metal valve stem are retained; and many new ones are gained.

Schrader DUBLTITE is the latest, and one of the greatest, of a long line of improvements in tire valves perfected by Schrader toward still better tire performance, greater value and more attractive appearance! A. Schrader's Son, Inc., Brooklyn, N. Y.; Toronto, Can.—*Makers of pneumatic valves since 1844.*

Eleven Outstanding Features

A Permanently air-tight at the base.

B Ruggedness resists severe weather conditions and chafing and strain at rim.

C Threaded stem permits either use or elimination of the usual hexagon nut, bridge washer and rim nut.

D Permits the use of attractive dust cap or that modern, convenient inflating cap—Schrader "Dublchek."

E *Has full pull-back feature*—readily pulls out of rim (if rim nut is omitted) in event of a "flat".

F Fits any rim-hole without rim modification; previous fittings and attachments can be used.

G Rigid threaded stem simplifies tire mounting and inflating.

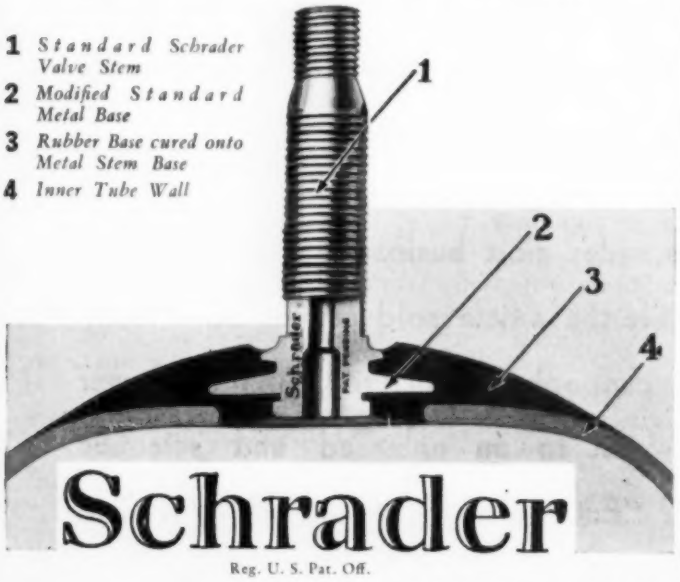
H Rigidity of stem allows ready application of extensions when necessary.

I Versatile—a few sizes replace entire line of passenger-car and truck straight and convertible valves.

J Beautiful in appearance with the new Schrader chromium-plated "Ezemount" cap.

K Uses standard valve core—*and protects it thoroughly.*

1 *Standard Schrader Valve Stem*
2 *Modified Standard Metal Base*
3 *Rubber Base cured onto Metal Stem Base*
4 *Inner Tube Wall*



Schrader

Reg. U. S. Pat. Off.

For Fair Division of Highway Support

JUST distribution of the burden of highway support involves carefully calculated taxes on motor vehicles, according to the report of the committee on motor vehicle taxes of the National Tax Association made last month at the annual meeting in Boston, Mass.

The committee, headed by Dr. James W. Martin, who is also director of research for the Interstate Commission on Conflicting Taxation, suggests the following principles for formulation of legislative policy on the "urgent problems of motor vehicle and related taxation:"

1. Motor transportation should pay special taxes for highway facilities and taxes for the support of general governmental functions.

2. Special highway taxes borne by motorists should be sufficient to pay the annual cost of highways, plus the share of the cost of local roads and arterial city streets which arises from general motor traffic.

3. In addition to the special highway taxes, persons engaged in motor transportation—using motor vehicles for commercial or personal recreational or business use—should pay general taxes as property owners and income receivers.

4. States and localities should not undertake highway projects which careful traffic analysis or other study has not shown to be economical. This will avoid unduly running up highway costs and hence motor taxes.

5. Special motor vehicle taxes in each state should be distributed among vehicles of different sizes, proportioned as nearly as possible to the highway cost occasioned by each class of vehicles.

6. A gasoline tax and a registration tax should constitute the "special taxes." The gas tax should be imposed at a flat rate in each state, based on receipts of fuel rather than on sales, to avoid evasion of the tax through purchase from fly-by-night operators. Close co-operation between states and with the federal government is urged, to avoid tax evasion.

7. Registration taxes for smaller vehicles should be based on the gross weight of vehicle and load, graduated so that the tax increases more than directly in proportion to the increase in gross weight. This graduated tax is essential, the committee explains, to offset failure of fuel consumption to increase as rapidly as gross ton mileage and to take account of the greater highway cost incurred for heavy vehicles.

●

How to Help Reduce Street Accidents

THE automotive industry's "debit" and "credit" sides of the ledger in its aid in reducing street accidents were reviewed in sessions of the automotive and machine shop section of the National Safety Congress, recently held.

The review was presented by Del A. Smith, Director of Public Relations, Department of Street Railways, Detroit, Mich., who praised the industry for its untiring efforts to build safety features into automobiles. On the "credit" side of the ledger, he also mentioned the industry's "substantial aid in marking highways, and in rendering assistance in their development, as well as formulating national codes of safe driving rules."

Mentioning what the automotive industry also might do in the interest of safety on the streets and highways, he said: "Most states enact their own laws, regulating the fitness of those who operate motor vehicles, but some of the states entirely disregard the importance of such regulations, or tolerate regulations that are not

sufficiently rigid to give the necessary protection. Also, it seems to us that the very first step to be taken is a move for standard regulations of a person's physical ability and mental alertness. There are agencies whose coordinated efforts could help in bringing this about, and one of these is the automotive industry. The insurance companies have some responsibility in the matter and the National Highways Association and the National Safety Council would render yeoman service. Enforcement of the regulations seems to lie properly within the province of the state.

"We hear of many cases where collisions between machines have resulted in diastrous fires, and it occurs to us, until such time as engines using lower grade fuel have been perfected, something in the way of a magazine could be attached, which would go into action whenever the spread of gasoline follows a collision. I have no doubt as to the ability of those who are concerned with these matters to perfect such a device.

"All upholstering should be as nearly non-flammable as possible, and still another major change, that appears in the offing, and that, in our belief, will make for greater safety, is the mounting of engines in the rear. From a standpoint of comfort and health, air conditioning is highly desirable."

●

Truck Tax Bill Exceeds $300,000,000

REVENUE derived by federal, state and local governments from motor truck taxation climbed to a new peak in 1933 when the more than three million trucks registered were assessed $303,467,000 in registration fees, gasoline and excise taxes, according to *Automobile Facts and Figures* recently released by the National Automobile Chamber of Commerce.

Truck taxes have continued to increase in face of a decline in truck registrations. Though trucks were but 13½ per cent of the motor vehicles registered last year, they paid nearly 27 per cent of the special motor vehicle tax bill.

"The climb of motor truck taxes has paralleled the rise of all motor vehicle taxes," declared Alfred Reeves, vice-president and general manager of the motor organization.

"The motor truck is one of the highest taxed commodities in the country and the revenue received therefrom is a substantial part of the cost of state highways. In addition to the highway use taxes, truck owners are paying huge sums in personal property taxes on trucks in operation and income and property taxes on garages, terminals, repair shops and trucking companies.

"These increasing burdens must, of course, be added to the price of foodstuffs and other necessities hauled over the highways.

"In several high-tax states the decline in registrations is more pronounced. Special highway taxes have been diverted to other uses than roads, thereby impairing progress with highway transportation."

Statistics obtained from government sources show that taxes on trucks above 5-tons capacity are nearly four times those levied on 1½-ton-or-less vehicles, due to the sliding scale method of increasing fees with increased capacities.

Truck owners who haul for compensation, whether common or contract carriers, pay considerably more than the shipper-owner, statistics from government sources indicate. The average special tax payment on a common carrier is 205 per cent greater than on a privately operated truck. The average special tax on a private truck is $60.15; on a contract carrier, $108.35, and common carrier, $183.49.

The
BASA
Rawhide-Faced Hammer
for **QUICK REPAIRS TO MOTOR CARS, TRUCKS AND BUSES**

A soft-faced Hammer is required, having the proper weight and balance that will not injure the surface struck.

The BASA Hammers are especially designed for Fleet Work, and are more economical than rawhide mallets, as the rawhide faces, when worn, can be replaced at small expense.

Hammer with nut loosened for removing faces.

Faces cannot shrink and become loose in hammer, as the jaws of head are screwed up firmly against faces, which mushroom at the back when struck, conforming with recess in jaw.

Hammer ready for use.

BASA faces can be depended upon for uniform quality and endurance.

BASA Hammers are made in five different sizes. Send for full particulars.

GREENE, TWEED & CO.
Sole Manufacturers
109 Duane St., New York

You EARN money buying EVEREADY PRESTONE!

"A PENNY SAVED IS A PENNY EARNED"

SAVE oil

The U. S. Bureau of Standards has pointed out that crankcase oil dilution may jump from 5% in summer to 50% in winter. Truck and bus manufacturers charge much of this increase to idling motors. With Eveready Prestone in the cooling system it isn't necessary to idle motors to prevent freeze-up.

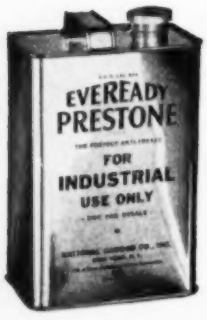
SAVE gasoline

An idling motor consumes fuel which must be charged against the cost of winter operation, and an idling motor consumes an *excess* amount of fuel, for the engine is running at a low temperature. Check the cost of the gasoline wasted against the low cost of permanent Eveready Prestone protection!

SAVE time

The old saying, "time is money," is certainly true in the trucking business. If the trucks aren't rolling, you aren't "making." One hold-up because of a frozen radiator costs you plenty more than a shot of guaranteed Eveready Prestone.

SAVE yourself worry



A clean, flushed-out cooling system and a shot of Eveready Prestone . . . and your freeze-up and rust problems are eliminated for the entire winter. This is the kind of maintenance service that reduces break-downs and loss of time due to freeze-up. And *that's* worth money in any language!

REMEMBER... "a penny saved is a penny earned."

And Eveready Prestone can EARN plenty for you this winter!

NATIONAL CARBON CO., INC., General Offices: New York, N. Y.

Unit of Union Carbide and Carbon Corporation

How to Make a Cost Analysis

(*Continued from page* 51)

sedans, would net the company about $950 per year. The author believes that this is possible, under a definite system of adequate control and proper maintenance. (See last month's issue for details on a proposed preventive maintenance system.)

Depreciation: The installation of a system of preventive maintenance should cut the depreciation item by prolonging the life of vehicles and maintaining a high trade-in value. However, no definite statement can be made as to possible savings on this item.

Insurance: Insurance rates, for the most part, are governed by a state insurance board and there is very little variation between the rates of various companies. There is a possibility of cutting insurance costs to a certain extent by keeping accidents down to a minimum, by the installation of various safety devices, and by using lighter vehicles on some routes. Mutual insurance companies declare a dividend of about 20% each year, and advantage might be taken of this feature. The latter point is entirely a matter of opinion, for a great deal depends on the strength and cooperation of the insurance companies themselves.

Rent: The item of rent has been discussed in the previous chapter (page 51 of the October issue of this publication). A possible saving of about $1,680 per year was indicated.

Labor and Repair Parts: Labor and Repair Parts were also considered in the last issue, and three alternatives were given as to how this item might be reduced. The maintenance costs for this newspaper fleet for the years 1933, 1932 and 1931 were, .01642, .01747, and .01566, respectively. Fleet costs are given, rather than costs for individual machines, for the allocation of labor distorts the true costs of all machines.

The author suggested, in the previous chapter, that the services of night men would not be needed if the fleet were housed in a public garage; also that outside maintenance might result in additional economies. These proposals merit consideration, for *there* is undoubtedly a splendid opportunity for a substantial reduction in maintenance costs.

Tires: The tire records of the fleet studied in this survey are not accurate enough to permit dogmatic statements as to possible savings. The tire costs, as compiled by the author, are more of an *average* cost for each vehicle, due to the fact that in many cases tires were applied one or two at a time and no mileage record at the time of application was kept. Tire costs may be materially cut by close supervision, installation of a preventive maintenance system, and a program of attention to proper inflation. (In this connection, the series of articles recently appearing in FLEET OWNER, by W. C. Bray, will be of interest.—Editor.)

Interest: Interest on investment is entirely a matter of opinion and may be completely disregarded, if the company so desires.

Oil: Oil is one of the smallest operating costs. This item has, in the past, been substantially reduced by the installation of an oil reclaimer in this fleet. A further reduction may be effected by keeping truck speeds down and reconditioning the motors at an earlier state.

Overhead: The overhead item, as assumed by the author, is a very conservative amount. In all probability, the true overhead is in excess of the amount assumed. As there are no grounds for specific suggestions, and as this item seems to be a negligible amount, in this case, it will not be discussed further.

Taxes: Taxes are definitely fixed by law. A certain

reduction is possible by buying lighter equipment whenever possible, for registrations are based on weight and capacity and excise taxes are based on current values of vehicles.

Miscellaneous: The Combined Publishing Company owns and operates a tow-truck equipped with a hoist. However, most road service calls are cared for by the spare 1½-ton truck. The author questions the advisability of keeping the tow truck, for the insurance policy covering collisions includes tow service as a legitimate item of expense; and, usually, the only time a car has to be towed by means of a hoist is after a wreck. An accurate record of the actual use of the tow truck could be kept, which would indicate whether or not it would be cheaper to dispose of it than to keep it.

(EDITOR'S NOTE: There's still more to this interesting thesis on fleet operation and maintenance. In our next issue the author will present a suggested cost-keeping system for this and similar small fleets to follow. We promise you that this article will be as interesting as the first two.—H. C. F.)

●

"Revving Up" the Old Macks

(Continued from page 22)

drawing of this operation is shown in Figure 2.) The same heavy governor springs were used.

It is absolutely essential that the changes in governed speed be made at the governor weights. Changes in setting of the governor throttle plate will not accomplish the proper result, as adjustments at this point control only the "leakage" past the throttle plate and do not alter the engine speed at which the governor moves to its closed position.

Seven of our AC Macks and six of our AB Macks have been successively changed over as described above, during the past eighteen months. These trucks are used for the heaviest kind of dump work, under steam shovels, on coal delivery and on batch work, hauling up to 105 miles per day. They do not receive any special consideration, as two or more drivers operate each truck.

These engines have been and are quite trouble-free units, as no bearings have burned out or loosened up, no pistons have broken and no motor failures of any nature have since been experienced, except for the breakage of two valve springs in one of the AB's. They have been operated largely on reclaimed motor oil which has been drained at 2,000-mile intervals.

Rebuilt as described, these engines, operating at the higher speeds, are free from all evidences of serious vibration or distress of any sort. The increased speed and liveliness of the trucks is most marked, on the hills as well as on the level. They run right away from similar trucks in which the changes have not been made.

The new set-up does not alter the miles per gallon of gasoline, as our records do not show a change and no complaints have been received, either on the trucks individually, or as a group. For a given engine with correct carburetion, gasoline consumption is dependent on cubic feet of engine displacement per ton-mile, and since this has not been changed in these trucks, there is no reason for increased gasoline consumption.

On the other hand, a *modern* six-cylinder engine, if it were geared to provide the same cubic feet of engine displacement per ton-mile, would consume a bit less gasoline, due to better manifolding and higher compression, which would probably effect a saving of about ½-cent per mile. But one would have to purchase a whole new truck costing around $5,000 to effect this

Achilles' mother, sea goddess Thetis, was prompted by the instinct of preservation to dip her son in the river Styx. She hoped to make him invulnerable, but in her anxiety forgot also to dip the heel by which she held him. In the siege of Troy, the arrow of Paris hit this vulnerable spot.

Consistent use of colloidal graphite, as manufactured by the Acheson Process, forms a "graphoid" surface on the friction parts. This valuable feature serves to protect the vulnerable rubbing parts. ❖ The employment of an adjunct oil which contains colloidal graphite assures a positive and efficient standby lubricant. One of the many advantages of the "graphoid" surface is its ability, in emergencies, to lubricate for relatively long periods should the oil supply become exhausted. Moreover, metal-to-metal contact is minimized when momentary oil film rupture occurs in cases of extreme temperatures and pressures. ❖ Service Managers, who have not already done so, are urged to test an oil containing this material. There are numerous adjunct lubricants of this type on the market. Technical Bulletin D112 will be sent on request.

Manufacturers of "DAG" Brand Colloidal Products

dag REG. U.S. PAT. OFF. COLLOIDAL PRODUCTS

Acheson

COLLOIDS CORPORATION

FOUNDED [1908] AS ACHESON OILDAG COMPANY

PORT HURON MICHIGAN

MODEL 15 UTILITY

Six Wheel Attachment for Trucks of the Ford and Chevrolet Class

Is illustrated here as shipped completely assembled, with frame extension. Ready to slip extension over the truck frame, rivet or bolt in place, connect up brake levers and spring shackles, move spare tire carrier assembly to the rear, and drive away as a proven six wheel truck.

Utility was First in the United States to develop 6 wheel attachments for 4 wheel trucks. Now has distributors in all principal cities. Write for special folders.

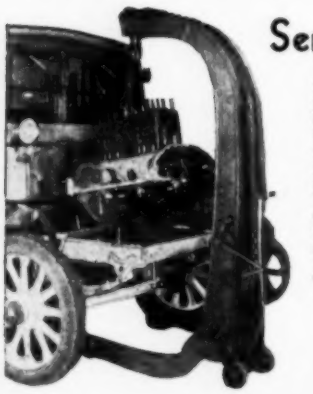
UTILITY TRAILER MANUFACTURING CO.
Box 1407 Arcade Annex **Los Angeles, California**

Pneumatic Tires for Milk-Wagon Fleet

(*Continued from page* 32)

of the impact of the rubber shoes of the horse on the road surfacing, tire noise being negligible."

"We believe ours was the first milk company to convert the steel-tired wagon wheel to one with solid rubber tires," Mr. Cronk said. "Our company operates over 200 wagons that are fitted with solid rubber tires. The pneumatic tire for milk wagons is really a development from the solid tires." About 1,800 milk wagons are being operated in the Metropolitan New York area by Borden's Farm Products Company, Inc.



Serves Many Purposes

Canton Portable Cranes are being used to advantage in scores of ways in fleet maintenance departments. For example, when removing heavy duty steel wheels, the crane can be used to raise the vehicle and then lift and remove the wheel itself. Wherever the vehicle may be, the crane being portable, can be easily taken to it—thus saving time and money. Write for full particulars.

THE CANTON FOUNDRY & MACHINE CO.
CANTON, OHIO
New York Office—Room 704
401 Broadway

saving, or at least a newer type engine, costing around $800. If his trucks operate 10,000 miles per year each (many operate less in these times), and a five-year depreciation period is figured, he will be paying 10c per mile depreciation in the case of the new truck. This point is cited to show that profitable truck operation depends on many factors, in addition to small differences in fuel consumption.

The horse-power and torque curves shown on page 22 will be found interesting. This chart shows that the power can actually be increased by governing the engine at higher speeds, as long as it is not governed *beyond* its horse-power peak.

It goes without saying, therefore, that the Mack manufacturers were quite conservative in their truck engine speeds. However, to exceed their factory-governed speeds to the extent which we have, we believe the parts changes which we have outlined are essential. These suggestions are rather elementary in the sense that the changes involved are simple and economic to make in the field, and this increase in road speed and performance of approximately 30% can be obtained by any operator of these trucks at the time of overhaul, for a cost averaging not more than $15.00 extra per truck.

There, we believe, is a remarkable opportunity for many fleet operators to obtain considerably more profitable operation from their old Macks, with a negligible investment.

In conclusion, I want to get a word or two in on the subject of air cleaners. We are extensive users of the oil-bath type air cleaner, and all of the trucks mentioned in this article are so equipped. The reduction in cylinder and ring wear which these cleaners effect is truly surprising, particularly if the truck drivers are posted on the advantages of keeping the water up to correct operating temperature in cold weather.

The Case for Winter Oils

(*Continued from page* 26)

hour, made in three 30-mile test periods. At the end of this test, the bearings, cylinders, pistons, and rings were in excellent condition. In addition, many other test cars have been driven under all types of service conditions with 10-W oils without experiencing difficulty.

"One of the most spectacular service records showing the ability of 20-W oil to properly lubricate an engine under severe operating conditions, occurred when Ab Jenkins made his record-breaking performance of driving a modified stock Pierce-Arrow, under summer desert heat conditions, 3,000 miles in 25½ hours, averaging 117.98 miles per hour, the engine speed at times being as high as 4,590 r.p.m. This run was made at Salduro, Utah, in August, 1933. The engine was lubricated with a popular brand of S.A.E. 20 oil, a winter oil within the limits of 20-W, although the cans in which the oil was sold were marked S.A.E. 20. (It should be noted that some S.A.E. 20 oils also come within the classification limits of 20-W and such oils may be sold as either S.A.E. 20 or 20-W.)

"This oil was used because previous tests had shown that it lubricated the car satisfactorily and, on account of the fact that it offered less friction to the moving parts as compared with the next higher viscosity, (S.A.E. 30), it permitted a higher maximum speed. Since the weather in the winter may vary from very

low temperatures to warm days in which summer temperatures are approached, it is apparent that the oil which is used in an automobile in winter should permit starting at the lowest temperature likely to be encountered and yet it should provide safe lubrication under high speed, high temperature conditions on the warmer days.

"The use of the oil meeting the limits of 20-W by the Pierce-Arrow in the Salt Lake test certainly indicated that the average operator will not take any chances if he uses 20-W for the most severe road service likely to be experienced in the winter months."

The above performance data have received much publicity and in themselves they should be convincing evidence to anyone that 20-W oil will properly lubricate an automotive engine under any conditions, in the service for which it is recommended. And, speaking of recommendations, let us see what Chevrolet engineers have to say on the subject. (We mention Chevrolet because many fleet operators are using them.) We quote:

"Lighter oils in Chevrolet engines will assure easy starting and proper lubrication. Remember—more mechanical trouble can come from using too heavy an oil than can come from using too light an oil (even if summer temperatures are encountered during the fall months). In cool autumn months when temperatures frequently drop as low as freezing, use 20-*W. In cold winter months when temperatures usually range from freezing to* 15 *degrees below zero, use* 10-*W. In sub-zero temperatures* (15 *degrees below zero and under) when encountered for continuous periods of time, use* 10-*W plus* 10% *kerosene."*

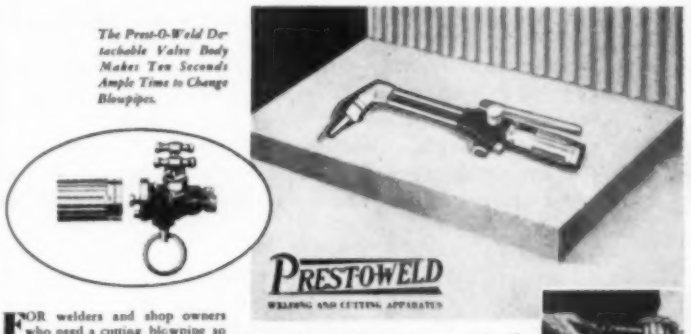
We hope that by this time we've convinced you that the new winter oils are really good lubricants, when used as recommended. This will be found particularly true in vehicles of more recent manufacture, which have closer limits throughout. Clearances will be found considerably less; manufacturing methods have been improved to such an extent that production to low tolerances has become economically possible. In these newer vehicles, light oils will find their way into very small spaces needing lubrication, where heavier oils might not.

The thing to remember, in connection with the use of low viscosity oils, is that the *quality* of the oil is still the most important feature. The new "W" oils are being offered, we believe, by most of the leading refiners. We do not know which is the best, and if we thought we did, we couldn't ethically tell you, so you alone will have to be the judge.

In conclusion, it should be pointed out that the use of lower viscosity oils may mean a greater consumption of oil, regardless of the operating conditions. At high speeds on prolonged runs, these low viscosity oils may give lower miles per gallon of oil than the owner might anticipate. In using these low viscosity oils, the oil level in the crankcase should be checked frequently and the level should be maintained. However, the lower viscosity oil, on account of causing less friction, will give more miles per gallon of gasoline, and the total cost of oil plus gasoline is usually less with low viscosity oils than with high viscosity oils. And, since motor oil has a direct relationship to the electrical equipment of the vehicle, it goes without saying that lighter oils will help to prolong battery life and help to prevent road failures caused by electrical troubles, to say nothing of the provision of easier starting on cold mornings, which *all* of us would like to have.

Every Shop

CAN USE *this Cutting Attachment—*



The Prest-O-Weld Detachable Valve Body Makes Ten Seconds Ample Time to Change Blowpipes.

PREST-O-WELD
WELDING AND CUTTING APPARATUS

FOR welders and shop owners who need a cutting blowpipe so seldom that it doesn't pay to buy a standard model, the Prest-O-Weld Cutting Attachment is just the thing. It costs less than a complete blowpipe, but it uses the same nozzles as the Prest-O-Weld Type C-105 Cutting Blowpipe and does the same kind of work. It is auxiliary equipment for either the Prest-O-Weld Type W-105 or Type W-106 Welding Blowpipe and is small enough to be carried in the pocket when not in use.

This cutting attachment is typical of the accessories which make Prest-O-Weld Blowpipes so widely useful and so truly economical for the welder or shop owner who does not care to make a large apparatus investment. Each Prest-O-Weld Blowpipe is so designed that with the proper accessories it will do almost every kind of welding or cutting job.

You can buy Prest-O-Weld Blowpipes from jobbers in all parts of the country. Prest-O-Weld jobbers will be glad to show them to you.

Prest-O-Weld Type CW-105 Cutting Attachment

The Prest-O-Weld Type CW-105 Cutting Attachment is of the single joint type and attaches directly to the Prest-O-Weld Detachable Valve Body. Although only 11 in. long and small enough to be carried in the operator's pocket when not in use, this attachment will cut metal up to 2 in. in thickness. It has all the advantages of design and construction which characterize full-size Prest-O-Weld Cutting Blowpipes. The two nozzles supplied with this blowpipe are the same as those used on the Type C-105 Cutting Blowpipe.

Prest-O-Weld Type CW-105 Cutting Attachment, complete with nozzles Nos. 1 and 2, lighter and wrench.....Price $21.00

Prices slightly higher west of the Rocky Mountains

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
IN CANADA, DOMINION OXYGEN COMPANY, LTD., TORONTO

Sales Offices:
Atlanta, Baltimore, Birmingham, Boston, Buffalo, Butte, Chicago, Cleveland, Dallas, Denver, Detroit, El Paso, Houston, Indianapolis, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Phoenix, Pittsburgh, Portland, Ore., St. Louis, Salt Lake City, San Francisco, Seattle, Spokane, Tulsa

LINDE OXYGEN · PREST-O-LITE ACETYLENE · OXWELD APPARATUS AND SUPPLIES · UNION CARBIDE

STOP ELECTRICAL CONNECTOR TROUBLES

With Pyle-National heavy-duty plugs and receptacles

Especially designed for use between trucks and trailers, insuring dependable operation of trailer lights and electrically operated brakes. Also used for standby power connection to refrigerating units.

Substantial weatherproof construction, and a positive locking device to prevent disconnection from road shocks are features that end road delays and the hazards of faulty lighting. Both plug and receptacle contacts are self-aligning, to maintain positive contact in spite of vibration and severe operating conditions.

Heavy-duty construction throughout, with bakelite insulation, insures dependable service and greatly reduces maintenance and repairs. Install these "truck type" connectors and stop tinkering and taking chances.

Weatherproof receptacle for surface mounting.

Enclosed plug construction prevents grounding of live contacts.

Receptacle for flush mounting. All receptacles have weatherproof spring covers.

Heavy cadimum plated steel shells withstand rough handling.

Send for Bulletin No. 189 with complete description and wiring diagrams.

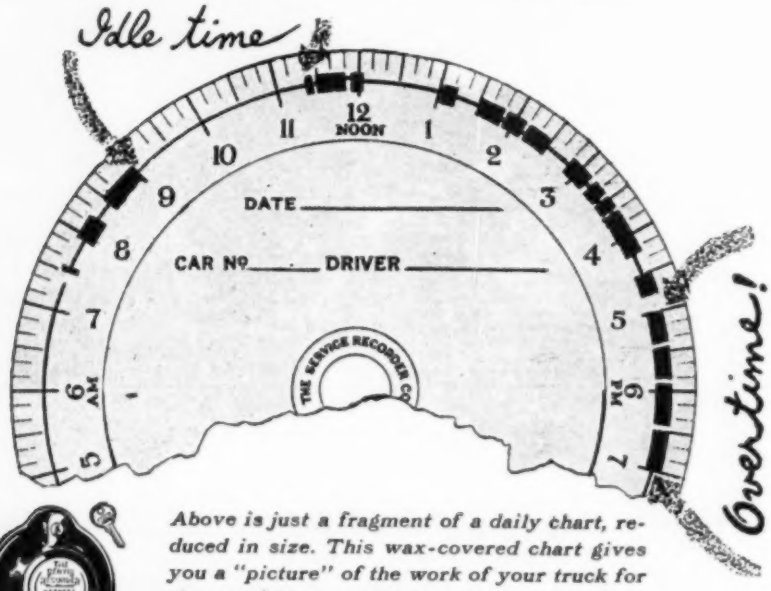
The PYLE-NATIONAL Company
1334-58 North Kostner Avenue. Chicago, Illinois.

OVERTIME!

Is it a habit with your truck?

One thing is certain —if your truck wastes an hour *during* the day, it will have to take an hour *after* closing time to get a day's work done. And that is what is happening with thousands of motor trucks.

If your truck is busy during the day and still has to work overtime, then pay your overtime cheerfully, and *on the basis of the chart of the Servis Recorder.* Don't have any more arguments about overtime. And don't have your trucks working after hours when they could finish everything *during* hours. The Servis Recorder will tell you on its chart the whole situation at a glance.



THE SERVIS RECORDER

Above is just a fragment of a daily chart, reduced in size. This wax-covered chart gives you a "picture" of the work of your truck for the past 24 hours, with busy time recorded automatically on it. The chart is inside the little Servis Recorder, *and the* Servis Recorder, *by the way, is attached to any truck merely by a couple of ordinary screws or bolts. Over 80,000 trucks have been equipped already.*

NRA WE DO OUR PART

Write for Bulletin F

THE SERVICE RECORDER COMPANY, Cleveland, O.

●

Snow-Removal Information

THE latest edition of "Marmon-Herrington *News*" contains some excellent information on snow-removal units. If you are in a county, state or municipal fleet you'll no doubt be interested. As a matter of fact, this publication is issued periodically, and if you are not on their mailing list, they'll be glad to place you. Just drop a line to Marmon-Herrington Company, Inc., Indianapolis, Ind., and mention FLEET OWNER, please.

●

The Latest in Truck Tanks

AN attractively illustrated eight-page brochure has just been published by the Farrell Manufacturing Co., Joliet, Ill., describing the various types and models of truck tanks they are making to meet modern bulk haulage conditions. Considerable space is devoted to the designing and construction of aluminum truck tanks. A copy of the folder may be had upon request. They'll want to know where you saw it, so you'll mention FLEET OWNER, won't you?

●

Warehouse Facilities Available (Adv.)

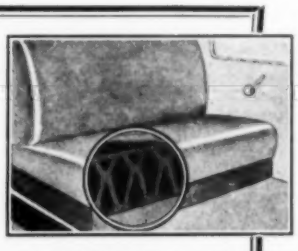
EASTERN branch and warehouse of prominent manufacturer of replacement parts for automobiles, trucks and buses, located in New York City, seeks additional line to warehouse and distribute. Has well established business with jobbers and fleet owners; also display space, drive-in service, delivery equipment, etc. Fully equipped to accomplish a thorough job. Might also consider national distribution. Address B. S., c/o Editor, FLEET OWNER, 90 West St., New York City.

●

Increase Your Export Business (Adv.)

RESIDENT Buyers' Representative, for Western Europe and French Morocco, interested in open lines of automotive products, including replacement parts, accessories and shop equipment. Planning trip abroad in early future. Manufacturers interested in additional foreign business in territories not at present covered, are invited to correspond. Address B. B., c/o Editor, FLEET OWNER, 90 West St., New York City.

FLEET OWNERS
Everywhere Equip
with
BLACK DIAMOND
All Rubber



BACK and SEAT CUSHIONS

because they are the best. No other cushion on the market gives the service at as low a cost. No maintenance expense. Made any size or shape. Write or wire for complete information and price list.

KARPEX MANUFACTURING CO.
INDIANAPOLIS, IND.

The BIG LIFT

Here's tremendous power, wide range, easy operation—in a full line of hydraulic jacks, hand and floor types, from 1 to 75-ton capacities. For floor, curb, road, and shop use — Buy Blackhawk. Ask your Jobber Salesman. Write us for literature.

Blackhawk Mfg. Co.
Dept. FO-11 Milwaukee

BLACKHAWK HYDRAULIC JACKS

Maintenance for Safety's Sake

(*Continued from page* 30)

for fairness to those poorly equipped shops and helps them correct methods of brake adjustments to a higher plane. Even with the low standards there were 25% of the vehicles that would not pass.

Steering and alignment account for a very large percentage of accidents and while standards were not so high, they expect to be later. Such defects account for about 15% of the rejections.

The public acceptance of the plan has been good. Very few arrests were imposed for non-compliance. The Bureau has created much employment in the industry, good shops reporting a satisfactory increase in labor and parts sales. While the "shade tree" garage and "fly-by-night" shop which is always a problem in the industry, flourished for a while after the Bureau was opened but the public soon found that with the lack of facilities and skill that the "cheap job" was quite unsatisfactory.

In general, the Inspection Bureau has elevated the standard of workmanship among the garage mechanics, as they soon realize that for the first time their employer and the public had a check on their quality of work.

It has been found by scientific tests over a period of years that new cars account for far too many defective brakes and in this the manufacturer cannot shift all the responsibility to the service station. Brakes on a majority of cars and trucks are of a design too prone to lose their efficiency. Competition among manufacturers is keen and many are inclined to save a dime wherever such saving will not react on sales. The market demands have emphasized comfort, acceleration and top speed.

When automobile and commercial vehicle buyers begin to select their equipment on a basis of safety and especially brakes, manufacturers will respond with needed improvements in that line.

When motor vehicle inspection bureaus become more numerous it will doubtless bring about a rapid change in design with emphasis on safety.

It must be remembered that the difference between good brakes and bad is that last ten feet of stopping distance where the crash occurs.

Statistics show a low percentage of accidents due to defective equipment, but no sane person should be led into the fallacy that mechanically defective cars are unimportant in the occurrence of accidents. Very often wrecked cars make it impossible to identify defects, and the unwillingness of live drivers and the inability of dead ones to admit the condition that existed prior to the accident.

In very few accidents does the reporting system even provide for an examination of the safety factors on the car. Such examinations would provide only data for statistics and material for a law suit. The logical time to make an inspection is *before* the accident happens.

Had there been no surviving witnesses to the recent Ossining, New York bus accident it is very probable that the report would have indicated "cause unknown" or "careless driving." A disastrous fire following any accident usually makes it impossible to determine the braking effort that existed prior to the accident. Among other things found defective on this bus was a loose clutch pedal which appears to have become entirely detached when the gears were shifted to neutral, this preventing a shift to low upon descending the grade at the bottom of the hill, where the accident occurred.

(*Please turn to page* 62)

LET THE SKINNER REPRESENTATIVE GIVE YOU THIS UNUSUAL DEMONSTRATION WITH YOUR OWN WASTE OIL, IN YOUR OWN PLANT

Fleet operators, truck owners and large users of oil are proving to themselves the unusual value of the new Skinner Stream-Line Oil Filter (patented). They're seeing tests made with their own oil right in their own plants—tests that will convince anyone of the ability of this sensational new money saving device to remove water, carbonaceous matter, silica, etc. from waste oil—right down to particles of 1/250,000 of an inch.

Save The Price of a New Truck or Bus!

The new Skinner Stream-Line Oil Filter, by enabling you to reclaim 94% to 98% of your crankcase drainings at a cost of only 1½ to 4c per gallon, will enable you to save the cost of a new truck, a new bus, or more, in a year. Not only that, you create substantial savings in operating and maintenance costs by removing their cause—hard carbon, grit, dirt, etc.

See It Yourself!

We'll send a representative with a miniature demonstration set (see cut above) to show you the actual results to be obtained with your own oil, in your own plant. Just mail the coupon—there's no obligation or charge. And remember, Skinner Stream-Line Oil Filters may be purchased in sizes priced as low as $125.

SKINNER MOTORS, Inc. 2225 Dalzelle St. Detroit, Michigan

MAIL THIS COUPON TODAY

SKINNER MOTORS, Inc., 2225 Dalzelle St., Detroit, Mich.
We want complete details on the new Stream-Line Filter
☐ Have representative call ☐ Send complete information

Name_____ Address_____

City_____ State_____

Say "I saw it in FLEET OWNER"—It Helps!

INDISPENSABLE!

Handy Perfection Air Cleaner installed on Ford V-8 Motor

Your motor can't steadily suck in dirt-laden air without swift and serious results. For dust and grit make an amazingly efficient grinding compound. Bearings loosen. Cylinder walls become out of round. Costs mount ruinously.

Handy Perfection Air Cleaner CATCHES THE DIRT. Not part of it but ALL of it. Not just for a while but FOR LIFE.

Unlike other air cleaners, the Handy is SELF-WASHING. Its condenser will never clog, require cleaning or replacement. Just dump the dirt, pour back the oil and keep on getting perfect results with a motor that is kept clean inside and therefore trouble-free, far beyond your wildest hope.

Sizes and styles to fit all cars, trucks and tractors, including those with down-draft carburetors. PRICES, $8.50 AND UP. YOUR INVESTMENT PAYS 1000% PLUS. Sold installed and serviced by 121 distributors. Write for full information.

HANDY GOVERNOR CORPORATION
DETROIT

HANDY PERFECTION AIR CLEANER

Ford V-8 Motor Wanted (Adv.)

WANTED: Good, slightly used or new Ford-V8 motor. Must be in first-class condition and complete with all units *except* transmission, clutch, fan and water-pumps. Please state full particulars. Will pay a reasonable price for a 1934 motor. Iron heads preferred. Address Box 507, FLEET OWNER, 90 West St., New York City.

New Replacement Carburetor

A NEW universal down-draft carburetor, Model BU, has recently been announced by The Marvel Carburetor Company, Flint, Mich., for replacement installation. The announcement states "While our primary interest has been to see that proper service was maintained on original equipment carburetors, such a demand has been made for a replacement carburetor during the last few years, that our service organization has decided to meet the market for carburetors on older model cars."

Catalog on Water-Pumps

THE Toledo Steel Products Company, manufacturers of valves and allied Toledo products, announce the new Toledo Water-Pump Parts Catalog. This catalog contains complete specifications on water-pump parts for all cars. An innovation is the listing of Toledo Water-Pump Parts Sets and complete Toledo Water Pumps. Fleet owners and their service stations may secure a copy of the new catalog by writing The Toledo Steel Products Company, 3370 Summit Street, Toledo, Ohio.

Champion Rubber Enters Field

ENTRY into the automotive replacement field was recently announced by Champion Rubber Company, Akron, Ohio. Products such as floor mats, brake lining, radiator hose, heater hose, car washer hose and other rubber specialties will be distributed to the automotive and fleet trade through jobbers in principal cities. A catalog has recently been made available, copies of which may be obtained free on request.

YOU CAN'T BURN or WASH OFF **HEATROIL** LUBRICATION

60 to 75% of motor wear occurs when starting and warming up. It's even worse in winter. HEATROIL in gas and oil penetrates and lays on all metal parts a thin glossy graphite which gives positive lubrication—all the time—for it cannot burn or wash off. It saves repair bills and doubles mileage from motor oil. HEATROIL, through a special blending process, gives the utmost protection available in a colloidal graphite oil—at the least cost.

JUST ADD SMALL AMOUNTS TO GAS & OIL

Write for complete details and special trial offer.

HEATROIL COMPANY
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AKRON, OHIO

MAINTENANCE COSTS SLASHED
BY REGROOVING SMOOTH TIRES
WITH THE STACKHOUSE
"PULL-TYPE" ELECTRIC TIRE GROOVER

NEW! SAFETY!
SPEEDY! TRACTION!
EFFICIENT! APPEARANCE!
PROFITABLE! INCREASED MILEAGE!

EASY TO OPERATE FULLY GUARANTEED

Write for Free Booklet
"Regrooving the Way to Increased Profits"

BAILEY & COMPANY
219 North 63rd Street, PHILADELPHIA PA.

Maintenance for Safety's Sake

(*Continued from page* 61)

After any disastrous bus or automobile accident, the public charges criminal negligence and too often that is true. The public, however, never wishes to share responsibility in any disaster. They have contributed in no small way to the accidents just referred to by permitting public carriers as well as private car owners to operate on the highways with defective equipment. The safety factors on your vehicles and mine is a matter of our own business only so long as it is on private property, but when that equipment moves on the highways, it then becomes a matter of public concern.

Many states have long recognized their responsibility by providing a system of motor vehicle inspection which has had a good effect in making the public safety conscious. The system of inspection provides a periodic appearance at public garages designated by the state. The industry has now practically outgrown such a system and several states are giving serious thought to a change to the Memphis Plan. Higher speeds require better brakes, steering and tires, and these require better supervision of the inspection than is possible under the State plan. One state has over 8000 inspection stations and only 30 supervisors. It means that there are 8000 different answers to what is wrong with your cars and mine.

Such a system places temptation before any appointed garage to favor friends and regular customers who provide his livelihood, and to over-inspect the casual customer or stranger to obtain all the repair work possible.

Serious consideration is now being given by some states to an early change to a state-equipped and operated inspection system with stations so distributed as to bring the entire car population reasonably near.

The better class of garages and dealers are in favor of such a change as the present system has many well-known evils. To establish such a state system with two inspections a year would not involve an annual expense of more than 65 cents per car per year and the first cost including housing would be less than one dollar per car registered. In two years the cost to the public would be much less than the present 50 cent fee twice a year and would produce real results in decreasing fatalities and property loss.

It has been proven that frequent and careful inspection by trained men is the cheapest method of reducing accidents. At the present rate of preventable automobile fatalities, 1934 will show about 35,000 deaths with 1,200,000 persons wounded.

A few months ago the world was shocked by the "*Morro Castle*" ship disaster off the Jersey Coast. Its horror is still in our minds and it is still front page news. Since that disaster happened, with our present automobile death rate, 2,500 of our citizens have been killed in preventable automobile accidents and 100,000 others wounded; many for life, but because it was not *mass killing*, it only made inside headlines.

The public whom you serve are now rightfully placing this humane and economic problem squarely up to you. Would it not be a move in the right direction for you, representing an organization or corporation, and interested in conserving life and property, reducing insurance costs and increasing employment, to recommend to your local and state authorities this practical common sense problem of maintenance, for safety's sake?

American made for American manufacturers

You can mark it better with DECALCOMANIA

The EASY method of transferring Permanent Lettering, Trade Marks and Pictorial Designs to Trucks, Buses, Wagons and Cars.

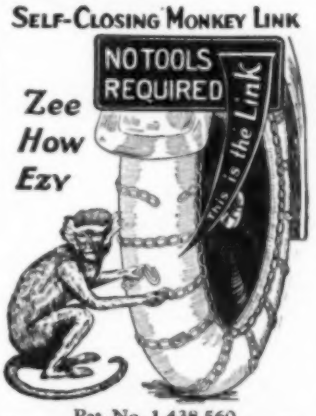
Branches in All Principal Cities

Ask for sketches and prices.

AMERICAN DECALCOMANIA CO.
4326 FIFTH AVE. CHICAGO

MASTERCRAFT
TRUCK BODIES
Production
and
Custom Built
Body Equipment
Vocationally Designed
LUCE MANUFACTURING CO.
Lansing, Michigan

SELF-CLOSING MONKEY LINK



Pat. No. 1,438,560
Trade Mark Reg. in U. S. Pat. Office

WHY BUY New Chains ?

Repair Them With Self-Closing
MONKEY LINKS

Carry them on your trucks and busses. Your driver can make instant repairs—no delay. No tools required. Insures safe driving at all times. Fits all tire chains.

Flower City Specialty Co.
ROCHESTER, N. Y.
At All Reputable Jobbers

Say "I saw it in FLEET OWNER"—It Helps!

There is Only One VELLUMOID

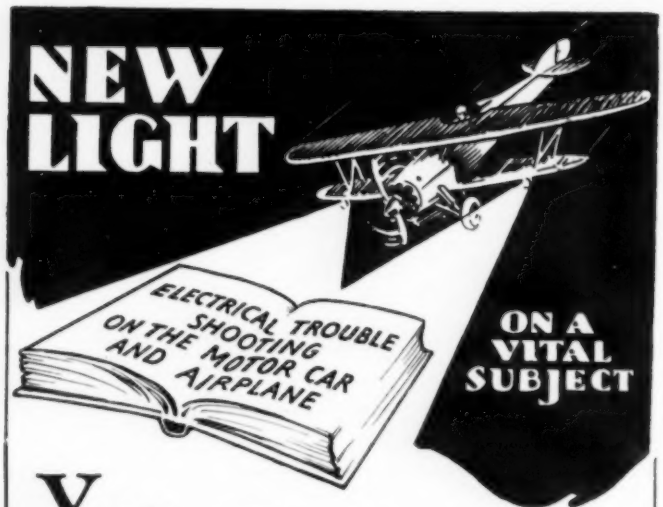
FOR 22 years VELLUMOID — the well known Oil, Gasoline, and Water Gasket Material — has been manufactured by the same management.

As always happens, competitive fibre packings have come into the field and VELLUMOID has been closely copied as far as outside appearance is concerned.

If you wish to use VELLUMOID instead of a substitute, won't you insist you receive it from your source of supply? Every foot of VELLUMOID is stamped with the name VELLUMOID.

VELLUMOID
THE REAL REPLACEMENT GASKET MATERIAL

The Vellumoid Co., Worcester, Mass.



You *will surely want a copy of*

"ELECTRICAL TROUBLE SHOOTING"

(on the Motor Car and Airplane)

By A. H. PACKER

The latest edition of this book covers everything from wiring to armature rewinding. Takes up generators, starters, cutouts and regulators on all cars, trucks, busses and airplanes. Contains scores of test kinks that will be found handy in the shop. Explains test bench construction; takes up flat rates; in fact anything electrical in the automotive game.

Earns its cost on first job's profits. Has 47 chapters, 330 pages, 333 illustrations, over 600 questions and answers, four trouble shooting charts and a thorough index. Size 5½ x 8 inches. Flexible binding. Price $4.00. Sold on five-day trial. Money back if not satisfied.

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TUBULAR
TRAILER AXLES
BUILT FOR TODAY'S
Mighty Loads

Shuler TUBULAR Axles are made from one-piece seamless tubing—heat treated and free from welds for added STRENGTH. Though tubular construction gives valuable lighter axle weight, their conservative capacity ratings are from 7,000 to 16,000 pounds.

Spring seats, radius rod lugs and any type brakes can be furnished to your own specification, and axles may be cambered or not as you desire.

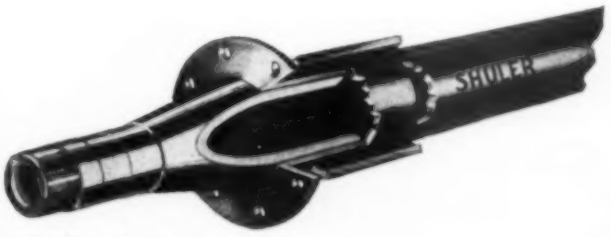
Write us today for our free technical advice on YOUR particular problems.

A complete line for
TRACTORS and TRAILERS
and FRONT AXLES
for
MOTOR TRUCKS and BUSES

SHULER AXLE COMPANY, Inc.

W. E. Dugan, President and General Manager

Louisville, Kentucky



Say "I saw it in FLEET OWNER"—It Helps!

why not get your

fenders

of your parts jobber?

WHY should you get smaller parts from this convenient source of supply—your parts jobber—and overlook the fact that he can also supply your fender needs?
Jobbers carrying Fostoria Fenders for Ford and Chevrolet as well as Dodge and other commercial fleets are located in every community.

THE FOSTORIA PRESSED STEEL CORPORATION
Dept. O-11 Fostoria, Ohio

GENUINE
Fostoria fenders

THE WORLD'S STANDARD REPLACEMENT FENDER

INCREASE SHIPPING FLOOR CAPACITY

MAKE EXTRA TRIPS WITH TRUCKS YOU HAVE NOW

~ BY USING ~

"ROLOFF" DEMOUNTABLE BODIES

ASK US HOW

ROLOFF, INC.
KENDALL SQUARE
CAMBRIDGE: MASS.

ORDER A TRIAL CAN

CHANGE YOUR OIL ONLY ½ AS OFTEN

GLAZOIL, added to your present motor oil, will halve your oil costs—you change ½ as often. GLAZOIL cuts repair bills too—"runs-in" new motors properly and lengthens life of old motors. Won't burn—won't freeze—won't break down. Keeps all wearing surfaces constantly "wet" with lubricant. Write us today for complete data. The Glazoil Products Co., 1614 Coutant Ave., Cleveland, Ohio.

Glazoil
COLLOIDAL GRAPHITE
REDUCES FRICTION—PROLONGS MOTOR LIFE

THE Cambridge Exhaust Gas Tester functions as well upon the road as in the shop. With reliable road performance data obtained from continuous exhaust gas analyses, proper adjustment for both economy and power are quickly and intelligently made. Idling motor operation in the shop does not duplicate motor operation on the road . . . under load. The Cambridge is designed to withstand road shocks and can be just as accurately read traveling over the roughest road as standing in the shop. Send for Booklet 144-E.

Cambridge Instrument Co., Inc.
3732 Grand Central Terminal
New York City

CAMBRIDGE EXHAUST GAS TESTER

11" x 8" x 8"—Wt. 29 lbs.

SPONGEX
(Sponge Rubber)
Honeycomb Cushions
for truck and bus seats cost less, last longer and are more comfortable.
Write for booklet
THE SPONGE RUBBER PRODUCTS CO.
Derby, Connecticut

ARMORPLY
A SUPERIOR METAL FACED PLYWOOD PANEL FOR BODY CONSTRUCTION
Write for samples and prices
UNITED STATES PLYWOOD CO. INC.
603 W. 36th. ST. NEW YORK CITY

Say "I saw it in FLEET OWNER"—It Helps!

WILL IT RESIST MARRING

One reason the Best Ice Cream Company's fleet of 175 vehicles always looks sleek and new is the remarkable resistance of Automotive DULUX to abrasion. The instrument shown here tests this quality in Automotive DULUX. A weighted block rubs sandpaper across a panel finished with Automotive DULUX. The number of strokes required to wear it through are counted and compared with the du Pont standard.

WILL the Automotive "DULUX" (air drying) on the truck shown here resist wearing? Will it withstand rubbing against a rough surface? The answer is *yes*—for this truck, or any other truck using this remarkable finish du Pont has developed for commercial vehicles. Du Pont makes certain of this quality with the Abrasion Tester.

And for checking color, drying time, flexibility, resistance to weather, hardness, thickness, general durability and other characteristics of Automotive "DULUX," du Pont uses other ingenious instruments. They are all part of the du Pont system of Pre-Testing—a system that eliminates guesswork and uncertainty from the manufacture of finishes, assuring that every gallon of Automotive "DULUX" made will measure up fully to the du Pont standard.

Fleet operators find that Automotive "DULUX" not only resists marring and scratching, but it also keeps its gloss longer, resists the harmful effects of gasoline, oil and traffic film. They find Automotive "DULUX" can be polished more times without wearing through—that bodies and fenders do not need touching up so often.

Decide now to cut your truck refinishing and maintenance costs by using Automotive "DULUX." Your own shop, or any Authorized du Pont Refinisher, can easily apply it with either spray or brush. Meantime may we help you work out standard Automotive "DULUX" specifications for your fleet? There is no charge for this service. Address E. I. du Pont de Nemours & Co., Inc., Dept. F11, Finishes Division, Refinishing Sales, Wilmington, Del.

DU PONT

REG. U. S. PAT. OFF.

AUTOMOTIVE

DULUX

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(AIR-DRYING)

DU PONT MAKES A COMPLETE LINE OF AUTOMOTIVE REFINISHING MATERIALS

ALCOA ALUMINUM did these 3 things FOR GRIFFIN

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August 15, 1934

ASSOCIATED
FUEL
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COAL

WOOD

SAWDUST

Aluminum Company of America
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Seattle Washington Attention Howard R Clyo

Gentlemen:

It may be of interest to you to know that in buying our three unit aluminum capped fuel body that we increased our pay load one-third and saved over one ton of weight. It was necessary to reduce our weight by one ton in order to be within the State Highway limit of 24,000 gross pounds for a four-wheeled vehicle.

By this additional pay load we paid completely for the aluminum body within three months. Our cost records show that at the end of the year we had a further saving of a decreased operating cost per unit because of the reduced body weight.

We feel satisfied that even if we had not increased our pay load, we would have been able to pay for the aluminum body out of the saving of operating cost within two years' time

The Isaacson Iron Works built a splendid body and we have had no cost whatever for repairs and, of course, no paint has been necessary during the time we have had it.

We are more than pleased with this unit and are very glad to inform you of this fact. If there is any other information or help that we can give you, we will be more than glad to do so.

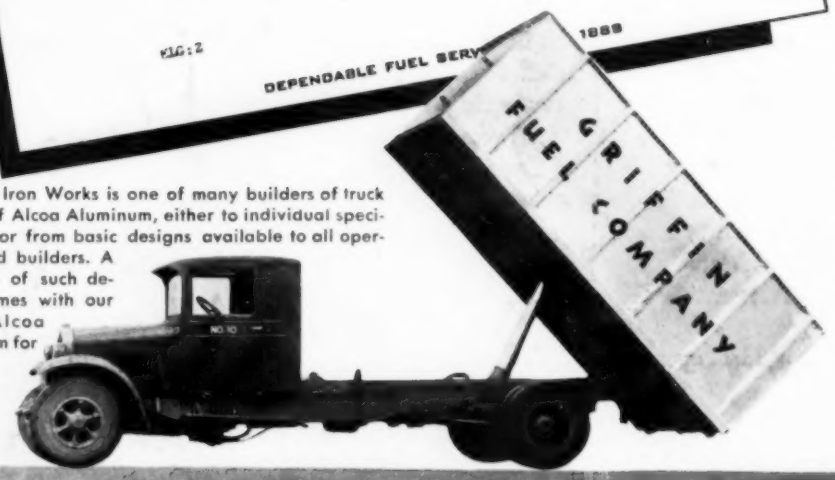
Very truly yours,

GRIFFIN FUEL COMPANY

By Edwin L Griffin
EDWIN L GRIFFIN
Manager

ELG:Z

DEPENDABLE FUEL SERV... 1888



Isaacson Iron Works is one of many builders of truck bodies of Alcoa Aluminum, either to individual specification, or from basic designs available to all operators and builders. A portfolio of such designs comes with our book, Alcoa Aluminum for Truck Bodies.

INCREASED PAY-LOAD 1/3
SAVED OVER ONE TON WEIGHT

★

FURTHER DECREASED
OPERATING COST

★

WITH NO REPAIR COST!

● Every line of Mr. Griffin's letter could well be quoted as an important reason why you will not only *save* money, but also *make* money by specifying Alcoa Aluminum for your next truck body. You can obtain the same kind of savings and increase your pay-load, whether it is coal, stone, gasoline, furniture, or general merchandise. We are happy to work with you or your builder on whatever your specific problem may be. Address ALUMINUM COMPANY OF AMERICA, 1861 Gulf Building, Pittsburgh, Pa.

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